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DODGE'S ADVANCED GEOGRAPHY



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DODGE'S ADVANCED GEOGRAPHY

By

RICHARD ELWOOD DODGE

*Professor of Geography, Teachers College, Columbia University, New York City;
editor of The Journal of Geography; and author of "A Reader
in Physical Geography for Beginners"*

PART I

THE PRINCIPLES OF GEOGRAPHY

PART II

COMPARATIVE GEOGRAPHY OF THE CONTINENTS



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CAROLINE W. HOTCHKISS, Seventh Grade, Horace Mann School, Teachers College, New York.

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THE PREFACE

THIS book has been written with the idea of emphasizing the "causal notion" in geography teaching. The first part, called "The Principles of Geography," treats of those phases of general geography which are necessary as a foundation for an intelligent and disciplinary study of the several continents from the causal standpoint. The significance of these topics in the later study of human geography is illustrated, wherever possible, by simple examples of the dependence of life on the physical environment, so that the pupils and the teachers may realize that these introductory chapters are important and necessary.

In that portion of the book devoted to the geography of the continents these principles are used and applied in the interpretation of life conditions. In each country the physical features, the animals, and the plants are described first so that the causal facts may be used as a basis for an understanding of the life consequences presented in the sections devoted to man and his work. The larger principles of Part I. are referred to frequently. Such cross references afford the best kind of review because the topics are taken up from another standpoint.

In the treatment of the physical features of continents and countries, references to the life consequences are included whenever any particular point is of wide significance. In the choice of physical topics to be introduced in the principles, preference has been given to those which are of the broadest application. For this reason greater attention has been given to climate than is usual in school geographies, while only those land forms have been treated which are needed in the later work. The climate of the world is studied from the standpoint of the wind systems. There is a closer relation between wind systems and human conditions than between heat belts and human conditions; hence there can be a better causal study of the climate of the world from the standpoint of the wind systems than from any other.

The last chapters in Part I. are devoted to a summary of the elementary principles of commerce so that pupils may understand the reasons for the details of commercial geography presented later.

In Part II. special emphasis is given to commercial geography because it is believed that this study deserves an important place in elementary school work. The endeavor has been not simply to present the dry statistics of commerce, which change rapidly, but also to show the relative commercial importance of the leading countries, the interrelation of the different countries commercially and the reasons therefor, especially so far as those reasons are geographically determined.

The book closes with a summary of the world's commerce and industry so as to bring the relative commercial importance of the leading nations clearly to the front in a brief review.

The "Questions and Exercises" have been prepared by Miss Caroline W. Hotchkiss, who for several years has made use of such questions in her teaching of geography in the Seventh Grade of the *Horace Mann School, New York City*. These questions are planned to make pupils think, to test their thoughts, and to give the best training in the study of maps and collateral reading.

It is believed by the author that pupils should gain from their school study an ability to learn more geography after their formal schooling has ceased. They should be able to use a map or an atlas and the more common books of reference.

Maps. The attention of geographers and geography teachers is especially invited to the large number and the excellence of the maps, all of which have been made especially for these geographies. Each continent and the United States is represented by three maps, a *physical map*, showing in accordance with the international color scheme, the land heights and the water depths; a *political map*, giving the latest information in regard to boundaries and other varying points, and a *commercial map*, showing the distribution of the leading commercial products, the routes of domestic commerce by land and water, and the principal oceanic routes.

The drawings for the maps have passed under the critical eye of Dr. J. Paul Goode, *Assistant Professor of Geography in the University of Chicago*, an expert in cartography.

Proper Names. For the spelling of all proper names in the United States and its dependencies, the decisions of the United States Board on Geographic Names have been followed, both on the maps and in the text. In the case of all other proper names the rulings of the Royal Geographical Society of London have been followed. At the heads of the different chapters devoted to the several sections of the United States the abbreviations for states, as authorized by the United States Post Office Department, are inserted for reference.

Illustrations. The illustrations have been chosen with care for their teaching value. They should be studied in association with the text and the maps, and may well be used as a basis for review questions in almost every chapter. They are largely from private collections, and thanks are especially due the following: Professor Francis E. Lloyd, Miss Ida E. Robbins, Miss Mary E. Calhoun, Miss Caroline W. Hotchkiss, and Miss Katherine Cochrane, all of the *Teachers College, New York City*; Mrs. E. P. Telford, Brooklyn, N. Y.; James B. Carrington and Mrs. C. M. Benson, New York City; George B. Reynolds, Evanston, Ill.; Wilifrid F. Beardsley, Evanston, Ill.; Reverend Sydney Strong, Oak Park, Ill.; Reverend J. F. Loba, Evanston, Ill.; the Atchison, Topeka & Santa Fe Railroad, Chicago, Ill.; David Goodale, Gleasondale, Mass.; Illinois Steel Company, South Chicago, Ill.; the Canadian Government; the Northern Pacific Railroad, St. Paul, Minn.; the Guatemala Coffee Company, Chicago, Ill.; the Department of Agriculture and the United States Geological Survey, Washington, D. C.; the American Museum of Natural History, New York City, and the Field Columbian Museum, Chicago. A number of the illustrations have been secured from the Detroit Photographic Company of Detroit, Mich., and the animals are nearly all from photographs taken and furnished by the New York Zoölogical Park.

Critics. In the preparation of these books the author has had the critical assistance of Dr. J. Paul Goode, *Assistant Professor of Geography in the University of Chicago*, and Miss Ellen C. Semple, Louisville, Ky., author of "American History and its Geographic Conditions." Doctor Goode, as an authority on cartography and economic geography, and Miss Semple as an author and student of anthropogeography, and both as successful teachers, have been able to give extremely valuable aid.

Each book has also had the criticism of two special critics who are successful teachers in the grades to which the book pertains. The special critics for this book are Miss Caroline W. Hotchkiss of the Seventh Grade of the *Horace Mann School, New York City*, and Miss Elizabeth Smith of the *Chicago Normal School*. Both of these teachers have been eminently successful in teaching geography in the upper grades, and have given valuable criticisms.

Among the other critics who have reviewed the text with care and offered many valuable suggestions are Superintendent C. N. Kendall, *Indianapolis, Ind.*; Miss Zonia Baber, of the *School of Education, the University of Chicago*; Professor D. C. Ridgeley of the *Illinois State Normal University, Normal, Ill.*; Professor M. S. W. Jefferson of the *State Normal College, Ypsilanti, Mich.*; Professor J. F. Chamberlain of the *Normal School, Los Angeles, Cal.*; Professor A. W. Farnham of the *Normal School, Oswego, N. Y.*; Professor E. D. Jones of the *University of Michigan, Ann Arbor, Mich.*; Superintendent L. C. Brogden of *Kinston, N. C.*, and Mr. S. Y. Gillan, *Milwaukee, Wis.*

The thanks of the author are due to his colleague, Miss Clara B. Kirchwey, who has given attention to the procuring of the illustrations and who has prepared the suggestions for collateral reading.

Suggestions and detailed criticisms will be welcomed by the author.

RICHARD ELWOOD DODGE.

Teachers College, Columbia University, New York City, August. 1904.

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A young valley in the Rocky Mountains. South Cheyenne Canyon, Colorado.

DODGE'S ADVANCED GEOGRAPHY

PART I

THE PRINCIPLES OF GEOGRAPHY

I. INTRODUCTORY

The Meaning of Geography. The study of geography is the study of the earth and its relation to the plants, animals, and men that live on its surface. When we are learning about the climate and the people of the tropical forests of Central Africa or the Philippines, or about the explorations of Nansen or Peary in the far north, we are studying geography.

When we look for spring flowers on the sunny, sheltered side of a hill rather than on the north side, or when we walk on the sunny side of the streets in winter and on the shady side in summer, we are making use of our knowledge of geography.

Geographical Facts and Principles. Our study of geography shows us that certain facts are much more important to learn and to remember than others, because some are permanent while others are constantly changing. For instance, the population of New York City or Chicago, or any other large place, changes daily; hence there is little to be gained from remembering the exact number of inhabitants in any city at a certain date. On the other hand, the location, climate, soil, slopes, and drainage which have led men to build large cities at the places mentioned, are practically unchanging and therefore important. Before the white man came the Indians occupied the island on which New York City stands, and for exactly

the same reason, because it was a convenient place to gain their living. Such truths as this are more than mere facts. They are *principles*, for they are true without regard to time or place.

A knowledge of geographical principles, therefore, will enable us to understand why men live and act in certain ways in one part of the world, and in different ways in another.

The Value of Geographical Principles. In the first part of this book we are to study the more important principles of geography, for they will help us to understand the geographical conditions of the world. Principles, or generalizations, are worked out through the study and comparison of many facts. We can understand the principles only when we know many facts from different parts of the world which serve to illustrate the principles.

For instance, we shall find the soil, the drainage, and the climate of the coastal areas of South Carolina, Louisiana, and Texas to be much alike. We shall also find that these three states raise great quantities of rice. We may then very rightfully say that wherever the conditions in other parts of the world are like those in these regions, rice can easily be raised. With this principle in mind it is not difficult to find out the possible rice-producing areas from a study of the maps and the text. In other words, a knowledge of the geographical conditions in one part of the world will help us to understand the conditions in another.

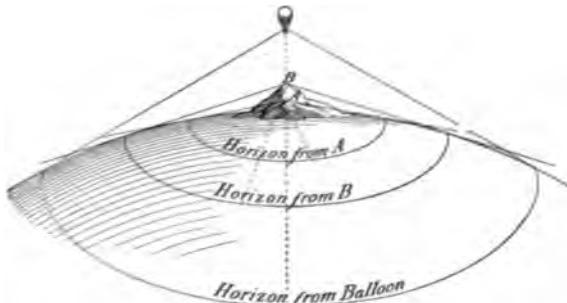


FIG. 1. A diagram showing the different horizons which may be seen from different elevations.

II. THE SHAPE AND SIZE OF THE EARTH

The Materials of Which the Earth is Composed. The earth is a large globular mass of matter, the outer portion of which is made of rock. In the larger depressions of the rock surface there are great volumes of water, and over all is the air. The rocks, the water, and the air are held in their relative positions because they are constantly drawn toward the center of the earth by the force which we call gravity. The heavy rocks form the central mass, while the water, which is heavier than air but lighter than rock, is drawn as near to the center of the earth as the rock will allow it to go. It is the attraction of gravity that keeps movable objects from falling off into space.

The Shape of the Earth. The globular earth is so large that we can see very little of its surface at any one moment, and that little appears flat. If we climb a tree or go up on a housetop, we can see more of the earth's surface than we can from the ground. From a high mountain we can see still more. (See Fig. 1.) Mountain tops are therefore frequently visited for the view they command, and high lookout towers are some-

times built on plains for the same purpose. In all places, however, we see a line in the distance where the earth and sky seem to meet. That line is known as the *horizon*.

A ship on the sea as it moves away from us will disappear over the horizon; that is, it passes over so large a part of the earth's surface that it gets out of sight on account of the earth's curvature. (See Figs. 2, 3, and 4.) The last sign of a steamship leaving port is the smoke, which has risen so high in the air that it is still visible when the vessel itself has disappeared. (See Fig. 5.)

The curvature of the earth is everywhere such that an object five feet in height is out of sight at a distance of four miles. If this were true in one direction only, we could merely say that the earth is cylindrical like a round tin can. But it is equally true in *all* directions. Therefore the shape is spherical, and the earth is a globe or sphere. The shape of the earth is also proved by the fact that the shadow of the earth cast upon the moon is always circular. (See Fig. 6.) As a sphere is the only body that always casts a circular shadow, the earth must be spherical.



FIG. 2. A steamer leaving New York Harbor.



FIG. 3. A telephoto picture of the same steamer six miles distant. Notice that the vessel is disappearing behind the curvature of the earth.



FIG. 4. A telephoto picture of the same steamer about twelve miles distant.

The Importance of the Shape of the Earth. The earth is not exactly a sphere, but is so nearly one that only careful study can detect the difference. It is of little importance to us that the earth is not quite spherical, but the fact that it is practically so is of great importance, for, owing to its shape, the attraction of gravity is nearly the same in all parts of the world. Because of the nearly equal attraction of gravity a man can walk over the level surface with the same ease everywhere. The birds can migrate from one part of the world to another without difficulty because their

muscles are able to move their weight anywhere. Steam vessels and railroad trains end their journeys with the same weight of freight as when they started.

Owing to the attraction of gravity, water or any other liquid is drawn toward the center of the earth until it is *level*. When we refer to a surface of large area, as the surface of a large lake or the sea, as being level, we do not mean that it is flat like a floor. We mean that it has no curvature other than the general curvature of the earth's surface.

By *up*, we mean away from the center of

the earth. So people on the opposite side of the earth stand with their feet down and their heads up just as we do.

The Size of the Earth. The earth is so large that people living in different parts of the same country often know very little about each other. In modern times the use of locomotives and steam vessels has made it possible to reach nearly all parts of the world with comparative ease. For this reason the earth does not seem so large as it once did.

The *exact* size of the earth is of no great importance to us. To know that it is about 25,000 miles in circumference gives us some idea of the length of time required to go around it in a fast steamer, traveling 500 miles a day, if we could follow a straight path. But, as we have learned, the earth is not quite a sphere, and the longest distance around it in a north and south direction is forty-two miles less than the longest distance around it in an east and west direction. This difference is too small to be shown by a globe or by any drawing we can make. A perfect globe illustrates the shape of the

earth accurately enough. (See Fig. 7.)

Questions and Exercises

- (1) When a sailor is approaching land does he see the base or the summit of a hill or tower

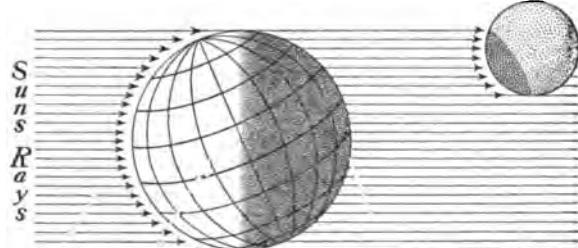


FIG. 6. A diagram showing how the earth casts a circular shadow on the moon.



FIG. 7. *The Western Hemisphere which contains North and South America.*



FIG. 8. *The Eastern Hemisphere which contains Eurasia, Africa, and Australia.*

first? Give the reason. (2) Draw a picture of a ship coming into a harbor, and show how the curved surface of the earth is illustrated by what a person on the shore sees. If you live on a level prairie, make another drawing to illustrate the same principle. (3) Draw a picture showing some experience of your own illustrating the curved surface of the earth. (4) How much of the earth's surface have you seen at one time? Where were you and what did you see? (5) At sea does the surface of the ocean look flat or curved? Why? (6) Which diameter of the earth is longer, the equatorial or the polar? (7) Does the fact that men have sailed around the earth show that it is spherical and not egg-shaped?

(8) Write in brief sentences what you have learned about the size and the shape of the earth.

III. THE MOTIONS OF THE EARTH

Kinds of Movements. The great globe on which we live is constantly in motion. It turns on its axis or *rotates* once in twenty-four hours, and it moves through the heavens or *revolves* around the sun in a fixed path once a year.

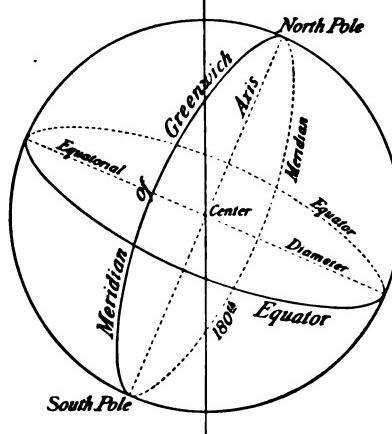


FIG. 9. *A diagram of the earth showing the axis, the equator, the prime meridian, and the poles.*

Rotation; the Earth's Axis; the Poles. The earth rotates daily on an *axis* or central line. (See Fig. 9.) The two extremities of this line on the earth's surface are known as the *Poles*. The pole nearest the North, or Pole-star, is known as the *North Pole*. (See Fig. 10.) The opposite pole is the *South Pole*. If we watch the stars in the northern sky on any night we see that certain stars, forming what is known as the Big Dipper, seem to swing around the Pole-star. The two stars farthest

from the handle are called the *pointers*, because a line connecting them always points toward the Pole-star. (See Figs. 10 and 11.)

If one could stand at either pole, he would simply be turned around once in twenty-four hours; his body would not move forward at all. This is well illustrated by an engine on a turntable. The cow-catcher and the rear of the tender have to be swung through a long distance in order to turn the

engine halfway round, while the middle of the engine is always over the same spot. In the same way points on the earth at a distance from the poles have to pass through a greater space in a day than points near them, and hence rotate more rapidly.

The Equator; the Hemispheres. Halfway between the poles there is a line of places which have a faster rotary motion than any other part of the world. These points, equally distant from the poles and having the most rapid rotary motion, form the *equator*. The half of the world north of the equator is called the *Northern Hemisphere* and the other half is known as the *Southern Hemisphere*. (See Fig. 12.)

Directions on the Earth. As a result of the earth's rotation we have certain easily determined directions on the earth. A line pointing toward the poles is a north-south line, and a line at right angles to this is known as an east-west line.

The points toward which these lines are directed, namely, north, east, south, and west, are called the *cardinal* points, and can be determined at night by finding the Pole-

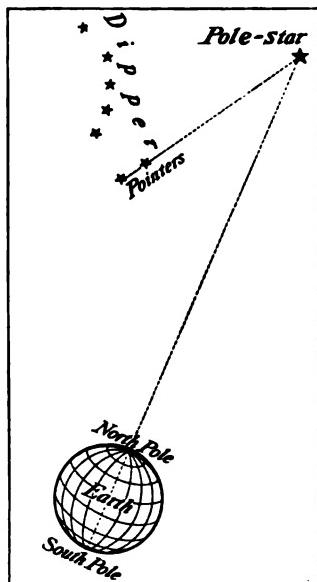


FIG. 10. The axis of the earth and the pointers are each in line with the Pole-star.

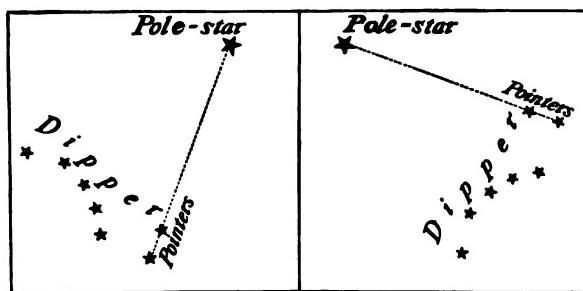


FIG. 11. The apparent change in position of the Big Dipper in six hours. It seems to revolve around the Pole-star every twenty-four hours.

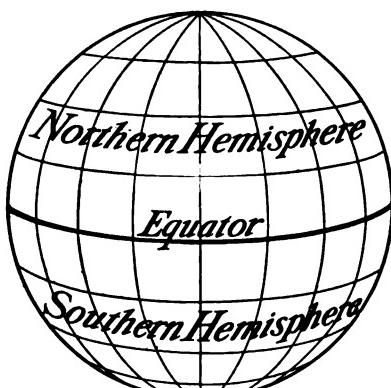


FIG. 12. A diagram of the earth showing the equator and the hemispheres.

star. Even uncivilized people know and use these four points.

The Compass. Any one who has lived in the open fields or in the forests, or who has been a sailor, can usually tell direction by means of the sun or stars. Most people, however, find it more convenient to use a compass (See Fig. 13.)

The compass is an instrument with a magnetic needle supported so as to swing about a point. A magnetic needle will always come to rest so that one end points toward the *North Magnetic Pole*. If the north pole and the magnetic pole were the same, the compass would tell us the true north. The north magnetic pole, how-

ever, is in northern Canada, and is some distance south of the north pole. (See Fig. 173.) Hence, it is necessary to know how much a compass varies from the true north, if we wish to measure direction accurately by means of it. When the sun shines the cardinal points

can be found by means of a common watch. Hold the watch in a horizontal position and point the short hand toward the sun. The south point of the dial



FIG. 13. A compass.

will then be halfway between the short hand and the XII. mark.

Daylight and Darkness. The earth, in its daily rotation, turns from west to east, so that the sun *seems* to move from east to west. The rate of rotation of the earth is usually measured by means of the sun. As the earth rotates toward the east, the place where we live turns first into sunlight and then into shadow, giving us day and night. (See Fig. 14.) Just before the sun appears in the eastern part of the sky and just after it disappears in the western part, we have *twilight*.

During twilight the sun is shining through the upper air, and the light of the air is reflected to the earth, making it partly light, or twilight. The constant change from day to night and night to day is therefore due to the earth's rotation.

Meridians.

When the sun is over a north-south line passing through our home, we say it is *noon*. This line, if extended, would pass through the north and south poles, and is known as the *meridian* or midday line. The earth must make a complete rotation to bring the sun over our meridian again and complete a day.

Every place to the east or west of us is on a different meridian from ours, and has its noon at a different time from ours, because the sun cannot be over more than one meridian at a time. The sun passes a meridian to the east of us before it is over our meridian,

and hence places to the east have their noon earlier than ours, and places to the west have theirs later. It would be inconvenient to distinguish as many meridians as there are north-south lines over the earth's surface, so 360 meridians are generally used, as a circle is commonly divided into 360 parts or degrees. (See Fig. 15.)

Longitude and Time. One meridian, that passing through Greenwich, England, is known as the *prime meridian* or *zero meridian*, and time all over the world is compared with Greenwich time. (See Fig. 16.) We describe the position of places

to the west of Greenwich as being in *West Longitude*, and to the east of it as being in *East Longitude*. (See Fig. 15.)

As it takes the earth twenty-four hours to make a complete rotation, the sun seems to

pass over fifteen degrees of the complete 360 degrees of the earth's circumference each hour. (See Fig. 15.) Therefore points which are fifteen degrees apart

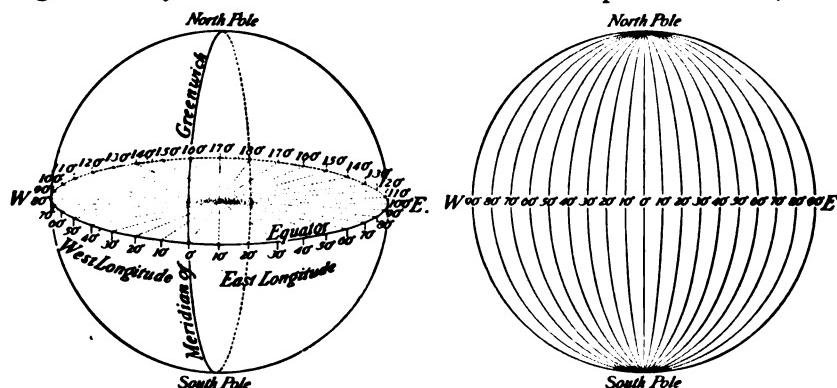


FIG. 15. Degrees of longitude and meridians by means of which places are located as east or west of the meridian of Greenwich.

vary in time by one hour. Time is reckoned the world over by means of the meridians. Shipmasters all carry clocks or chronometers which tell Greenwich time, and when it is noon where they are, which they can tell by observing the sun, they find out by their chronometers what time it is at Greenwich, and thus learn how far east or west of the meridian of Greenwich they are.

For example, suppose it is noon at Greenwich, it is then midnight one-half way around

the world from Greenwich; that is, on the 180th meridian. At the same moment at all points west of Greenwich to the 180th meridian it is some hour between midnight and noon (that is forenoon of the same day), while in the opposite direction it is some hour between noon and midnight (that is afternoon of the same day). When it is noon at Greenwich a new day is beginning at the 180th meridian. As the noon hour moves west from Greenwich, the new day moves west from the 180th meridian until in twenty-four hours midnight again occurs at the 180th meridian and a new day begins.

When it is noon at New Orleans on the 90th meridian, west longitude, it is six o'clock in the evening at Greenwich and six o'clock in the morning of the next day on the 180th meridian. When it is Tuesday noon at New Orleans, it is Tuesday evening at Greenwich and Tuesday midnight at ninety degrees east longitude. The next moment Wednesday begins at ninety degrees east longitude; it continues its journey westward and in six hours will reach Greenwich.

The International Date Line. The above paragraph has shown us that there is a difference in date between Greenwich and the 180th meridian, as, when it is Thursday afternoon at Greenwich it is Friday forenoon at the 180th meridian. The 180th meridian passes through the Pacific Ocean, where there is little land, so that few people except sailors are bothered by this change in date. There are a few groups of islands, like our Aleutian Islands, however, which are on both sides of the 180th meridian. As it would be inconvenient for a part of these islands to use a different date from the rest, it has been agreed that the day shall not

change everywhere at the 180th meridian, but along an irregular line shown on the map (see Fig. 119) and known as the *International Date Line*. This line has been drawn so that no two neighboring regions belonging to the same country shall have different dates at the same time.

If you were on a steamer going from San Francisco to Japan, it would be necessary when the steamer crossed this line for you to change your reckoning exactly one day; for instance, if you reached the line on Monday noon, after crossing the line you would have

to call it Tuesday noon. If you were going in the opposite direction, you would have to call it Sunday noon.

Questions and Exercises

(1) Draw a circle two inches in diameter to represent the earth. Indicate the Northern Hemisphere; the South-

ern. Draw a line to represent all the places in your hemisphere which have the same speed of rotation as you. What will you call this line? To what is it parallel?

(2) Take a sheet of blank paper such as you use for your school exercises and place on a table which has no iron near it; see that the long sides are parallel with the long sides of the room. Draw a small oblong to represent your teacher's desk. Draw another to represent your position in the room. Without moving the sheet from its position, draw a north and south line through the center of the sheet and cross it with an east and west line. Use colored pencils for your work, and make the sheet attractive. In which directions do the long sides of the room run? Which direction do you face? (3) With the help of a good compass and a ruler, draw your meridian line on the floor of your schoolroom. Find out the magnetic variation at your home, so that the line shall be exactly right.

(4) Locate the magnetic pole. In which direction would the compass needle point if you stood north of the magnetic pole?

(5) Look for the Pole-star to-night. Find the Big Dipper and draw a diagram to show its position with regard to the Pole-star.

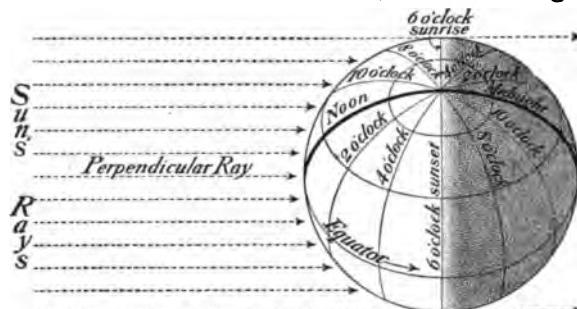


FIG. 16. A diagram showing the time on different meridians when it is noon at Greenwich.

(6) Point a cane or pointer through an open window at the Big Dipper or some familiar group of stars near the Pole-star. Do this by holding your eye at one end of the cane, noting just the place among the stars to which it points. Arrange the pointer so that it shall not move, and make another observation an hour after the first. If possible, make three observations an hour apart. Report on what you have noted with regard to the apparent movement of these stars. Give the reason. Do the same with the moon.

(7) Observe the direction and length of your shadow at 9 A. M., 12 M., and at 5 P. M. Draw a picture illustrating your observations.

In what direction does your noon shadow point? When is your shadow shortest?

How could you easily find north if you were lost without a compass? (8)

When it is noon at your home, what time is it on a meridian fifteen degrees to the west? To the east? When it is noon at New Orleans, what time is it at Memphis?

When it is noon at Cairo in Africa, what time is it at Zomba in Africa? (9) In what direction is the shadow of the Washington Monument, Washington, D. C., pointing at this moment?

The shadow of the obelisk in front of St. Peter's at Rome? The Bunker Hill Monument, Boston?

(10) Over how many degrees of the earth's surface does the sun pass in twenty-four hours? In one hour? (11) Locate Greenwich. (12) On which meridian is Calcutta? New Orleans? Your home? (13) Trace the International Date Line. What time is it on that line when it is noon at Greenwich? (14) Suppose when it is noon on some ship at sea its chronometer shows time at Greenwich to be 3.30 P. M. In what longitude is the ship? (15) Name three cities in east longitude; three in west longitude. (16) What time is it now in the Philippines? In Hawaii? At Greenwich? At Tokyo?

IV. THE MOTIONS OF THE EARTH (Continued)

Revolution. The other great motion of the earth, that about the sun in the course of a year, is known as *revolution*. The earth, rotating or spinning all the time, circles around the sun much as a spinning top sometimes moves about the floor. The earth does not spin like the top with its axis straight up and down, but with it inclined to the plane in which

it moves at the angle shown in accompanying figure. (See Fig. 17.) This angle of inclination from the perpendicular is $23\frac{1}{2}$ degrees, or a little more than one-fourth of a right angle.

As the earth moves about the sun in a nearly circular path, the north pole first leans toward the sun. When the earth has reached the opposite position in its course the north pole leans away from

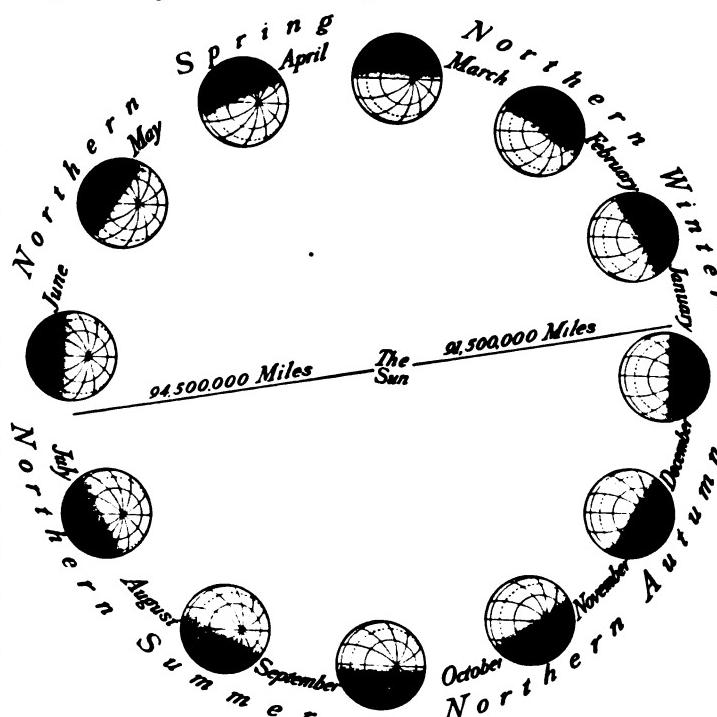


FIG. 17. Position of the earth in its orbit each month. Notice that the axis always points in the same direction.

the sun. That is, each pole is at one time in the sunlight and then, six months later, in the shadow of the earth. In order to make this motion clear, thrust a knitting needle, or long hat pin, through an apple from bloom end to stem end. Then tilt the needle to the proper angle and move it and the apple about some central object representing the sun. It will then readily be seen that though the needle always points in the same direction, as does the earth's axis, it leans toward the central object when in one position

and away from it when in the opposite position, just as the poles of the earth do.

The distribution of sunlight over the earth therefore changes constantly, and as a result we have different seasons. (See Fig. 17.) The best method of illustrating the way the earth is lighted by

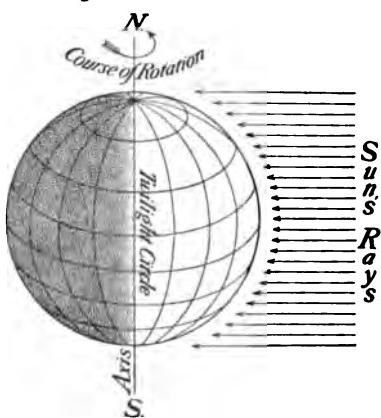


FIG. 18. *The sun's rays reaching both poles at the equinoxes.*

the sun is by means of a globe and a light in a darkened room. In whatever position the globe is held it will always be half in the light and half in the dark. The boundary between the dark and light side will be a circle dividing the globe into halves. This circle on the earth is called the *twilight circle*, because it marks the boundary between day and night. The twilight circle always cuts the equator in halves; hence daytime and night at the equator are always equal, each twelve hours in length. (See Figs. 18, 19, and 20.)

The Equinoxes. When the sun is directly overhead, or *in the zenith*, at the equator, the twilight circle passes through the poles, the days and nights are equal in length throughout the world, and all the earth is lighted in each twenty-four hours. This occurs on the twenty-first of March and the twenty-second of September, and hence these

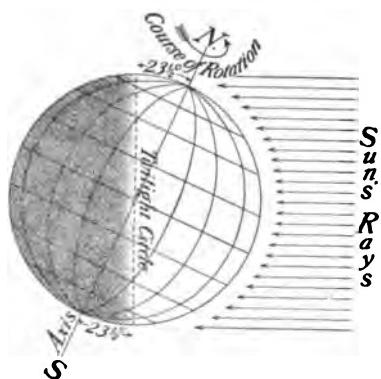


FIG. 19. *The sun's rays reaching 23½ degrees beyond the north pole at the summer solstice.*

two dates are known as the *equinoxes*, or the times of equal days and nights. (See Fig. 18.)

Summer and Winter. As the earth moves along in its course from the twenty-first of March the north pole leans more and more toward the sun, until it reaches its extreme position on June twenty-second. Then the sun shines 23½ degrees beyond the north pole. At this time it also fails to reach the south pole by 23½ degrees. Thus, there is at this season a circular area about the north pole which is continually in sunlight and one about the south pole which is continually in darkness. (See Fig. 19.) Six months later, that is, on the twenty-second of December, the conditions are reversed;

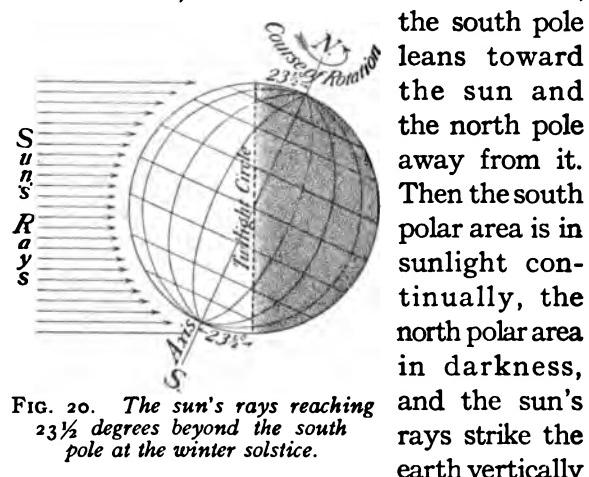


FIG. 20. *The sun's rays reaching 23½ degrees beyond the south pole at the winter solstice.*

the south pole leans toward the sun and the north pole away from it. Then the south polar area is in sunlight continually, the north polar area in darkness, and the sun's rays strike the earth vertically

at noon 23½ degrees south of the equator. (See Fig. 20.)

Between the twenty-first of March and the twenty-second of September the larger part of the lighted half of the earth is in the Northern Hemisphere, and the days in that hemisphere are everywhere longer than the nights. In the six months from the twenty-second of September to the twenty-first of March the days in the Southern Hemisphere are similarly longer than the nights. Thus, the Northern Hemisphere has summer while the Southern Hemisphere has winter, and it has winter while the Southern Hemisphere has summer. In the Southern Hemisphere the

sports that are indulged in at the Christmas season are those we enjoy in midsummer.

Circles and Tropics. The boundary lines of the polar areas are therefore circles $23\frac{1}{2}$ degrees from either pole and marking the extreme limit of the sun's rays on the twenty-second of December in the Northern Hemisphere and on the twenty-second of June in the Southern Hemisphere. These two circles are therefore important lines and are known as the *Arctic* and *Antarctic Circles*. (See Fig. 21.) The northern and southern limits of the vertical sun are known as the *Tropics*, from a word meaning "to turn," because the vertical rays first advance toward these lines and then recede. The tropic in the Northern Hemisphere is known as the *Tropic of Cancer*, and that in the Southern Hemisphere as the *Tropic of Capricorn*. (See Fig. 21.)

Zones of Sunlight. Between the Tropic of Cancer and the Tropic of Capricorn lies the Tropical Zone of Sunlight, within which the sun is always vertical somewhere. It is vertical at every place in this zone, except the tropics themselves, twice a year—once as the vertical rays move north and once as they move south.

Between the circles and the tropics are two areas, known as the *Temperate Zones of Sunlight*. In these regions the sun shines every day, but it is never directly overhead. Near the tropics it is almost overhead in summer, while near the circles it is very low in the sky in winter, so that its rays cast long shadows and give little warmth. In our spring months the sun rises higher and higher in the heavens each day and the days grow longer. In the autumn months it sinks lower and lower and the nights grow longer. At the poles there are six months of darkness and six months of daylight. At the

equator, as we have seen, there are always twelve hours of daylight and twelve hours of darkness. Everywhere else the days and nights are unequal in length except on the twenty-first of March and the twenty-second of September, when the days and nights are of equal length the world over.

Latitude. We have already seen how the rotation of the earth enables us to make use of the sun in calculating time and in finding how far east or west of the meridian of Greenwich we are. In this way we get our longitude by the sun. A knowledge of how the earth rotates and revolves also enables us to tell how far north or south of the equator we are. Our position with reference to the equator is known as our *Latitude*. Thus, by knowing our position with reference to the north-south Greenwich meridian and the east-west equator, we can find our exact position on the earth.

The latitude of a place is most easily found by locating the position of the Pole-stars

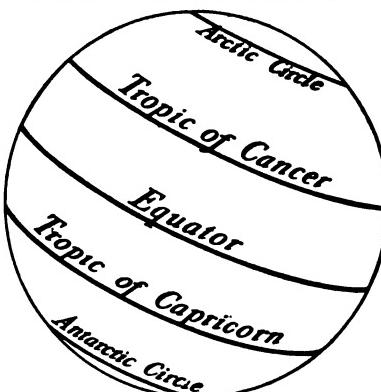


FIG. 21. *The earth, showing the principal circles.*

in the sky. A person standing at the equator would see the North Star on the northern horizon and the Southern Cross nearly on the southern horizon. If a person could reach the north pole, the North Star would be in the zenith. Everywhere between, there would be a different angle between the plane of the horizon and the line from one's eye to the North Star.

At the equator, where the North Star appears on the horizon, the latitude is zero degrees. The distance between either of the poles and the equator is one-fourth of the circumference of the globe; that is, one-fourth of 360 degrees, or ninety degrees. At the poles, therefore, the latitude is ninety degrees, and at all places between the poles and the equator it is somewhere between zero degrees and ninety degrees.

Everywhere in the Northern Hemisphere the latitude may be found by measuring the angle between the Pole-star and the horizon. We can use latitude to measure distance, because we know how large the world is and can divide the distance from the pole to the equator into ninety parts, each of which is a degree in length. (See Fig. 22.) The average length of a degree of latitude is 69.09 miles.

Parallels of Latitude. All points the same distance from the equator have the same latitude, and may be imagined to be joined together by

a line, just as the places which are at the greatest distance from the poles are imagined to be joined by a line known as the equator.

All of these lines would

be parallel to the equator and are, therefore, called *parallels*. (See Fig. 22.) The parallels that are the most used are those which are ten degrees of latitude apart, just as the meridians most used are those ten degrees apart. By knowing our position with reference to the crossing of a meridian and a parallel we know our position on the earth, just as in cities our street and number tells us our position north, south, east, or west of certain streets chosen as starting points.

Latitude and longitude are very important, especially in the great plains of the world or on the ocean, where no one would know his position unless he could calculate it from the stars. Sailors the world over therefore find their latitude and longitude frequently.

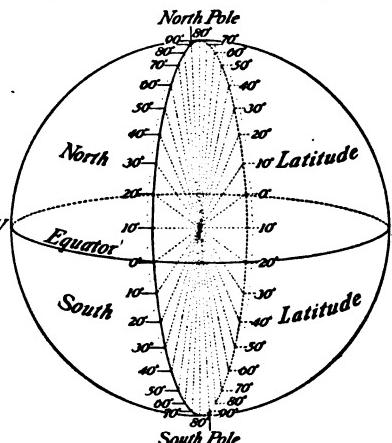
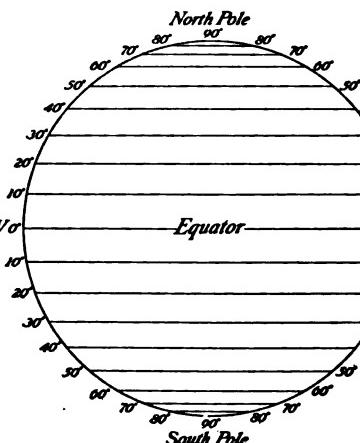


FIG. 22. Degrees and parallels of latitude by means of which we locate places with reference to the equator.

Maps and Map Scales. Latitude and longitude are of great importance to all people who use maps, because all maps are drawn to show the position of places in the world by their latitudes and longitudes. Any map is a plan showing the position of objects on a part or the whole of the earth's surface.

Maps drawn to show in a detailed way the features of a small section, like city or town maps, or the plan of a farm, are very much easier to draw and to read than are some of the maps in this book, where the whole world has to be represented on less than



one page. Such detailed maps are said to be drawn on a large scale, while maps like those of the world which are used in this book are drawn on a smaller scale.

Scale is usually expressed by lines drawn to show how many miles on the earth a given length represents. (See Fig. 173.) Scale may also be expressed by a fraction, the numerator of which shows how many inches on the map are used to represent the number of inches on the earth indicated by the denominator. For instance, if we desire to express the scale of a map drawn on the scale of an inch to a mile, it may be done in several ways. A line one inch long and labeled one mile would give a measure which could easily be used in finding any distances on the map desired. The fraction $\frac{1}{63,360}$ would mean the same thing; that is, that one inch on the map represents a mile, or 63,360 inches, on the earth's surface. We can see from

this how necessary it is to make use of the scale in studying a map.

On all maps of large areas the meridians of longitude and the parallels of latitude are shown as continuous black lines. These lines are numbered to show the position of the area they enclose in relation to the earth as a whole.

In this book the scale is shown by a line which represents a certain number of miles. This scale is placed with the title of the map and other information, which together form the *legend*. In comparing areas on different maps the scale on which the maps are drawn must always be taken into account. Continents should be compared on a world map; the countries of a continent on a large-scale map of that continent; and the states and provinces of a country on a large-scale map showing the entire area of that country. It is only by knowing the scale on which any two maps are drawn that we can accurately compare all or parts of their areas.

Map Projections. In large-scale maps the meridians run up and down the map, and the parallels across the map. Owing, however, to the fact that the earth's surface is curved and the map sheet flat, it is very hard to show large areas in their true proportions on a map, as can readily be seen by any one who tries to flatten out a large piece of orange peeling without breaking it. Therefore world and continent maps are drawn according to some definite plan which will tell the truth as closely as possible. These plans are called *projections*.

In those maps in which the meridians and parallels are at right angles to each other the earth's surface is represented as though it were an unrolled cylinder, rather than an opened-out globe. In such maps the regions near the poles are expanded to cover more space on the map than the same amount of globe surface nearer the equator. Such maps are very convenient for showing directions, though

they may give us wrong impressions of areas and distances.

In every small map of a large area some form of projection is used, and it is necessary to know the projection as well as the scale of the map in order to understand it. For our purposes it is only necessary to remember that the meridians show the north-south lines, and the parallels the east-west lines. By the study of these lines we can tell the direction of one point from another, and by studying the scale we can estimate distances between them.



FIG. 23. *The Northern Hemisphere, which contains the greater part of the land of the world.*

Questions and Exercises

(1) What gives us our day? Our year? In which direction does the sun apparently move across the sky? The moon? The stars?

(2) Draw a two-inch circle to represent the earth's surface. Locate the poles. Draw the twilight circle and shade the part of the world in shadow as it would be on the twenty-first of March. On what other day would this circle have the same position? (3) Draw a diagram or picture to represent yourself standing at the equator on the twenty-second of September. Show where the sun would be at noon. Draw a companion picture to show where the sun would be at noon on the same day at your home. (4) In which direction would your

shadow point at noon at Buenos Aires on the twenty-second of September? Would your shadow be longer on that day at Buenos Aires or at Para?

(5) Counting thirty days to a month, calculate the number of hours of sunlight the north pole might receive in a year. Do the same at a place on the equator and compare results.

(6) Draw a circle to represent the earth's outline. Show the Tropical Zone of Sunlight. Below the drawing write a statement telling why it is so called. Do the same for the Temperate Zones of Sunlight. State the special feature of these zones. (7) Trace the path of the sun in your sky to-day. At what time does the sun rise? At what time does it set? How



FIG. 24. *The Southern Hemisphere, which is largely composed of water.*

long is your period of daylight? As the season progresses will the sun move nearer or farther from the zenith at noon? Will the number of hours of sunlight increase or decrease?

(8) Find the latitude of Natal; Cairo; St. Paul; the large city nearest your home. (9) Explain why the people of Natal never see the Pole-star. Find a town in Africa where the Pole-star is visible on the horizon; find one in South America. What is the latitude of these towns? (10) What is the scale of the map of North America in this book? How many inches represent one mile? Find a map on a larger scale. How many square miles are represented by one square inch on the first map? On the second? (11) On the map of North America find the direction of St. Louis from New Orleans; of Salt Lake City from New York; of Savannah from Detroit.

V. THE CONTINENTS AND OCEANS

Distribution of Land and Water. As we look at the globe, which is our best representation of the larger features of the world, we see that the surface of the earth is made up of land and water. About seven-tenths of the surface is water and the remaining three-tenths land. (See Fig. 28.) Deep under the water, however, there is solid rock forming a part of the solid earth. It is in the greater depressions of the rock mass that we have oceans.

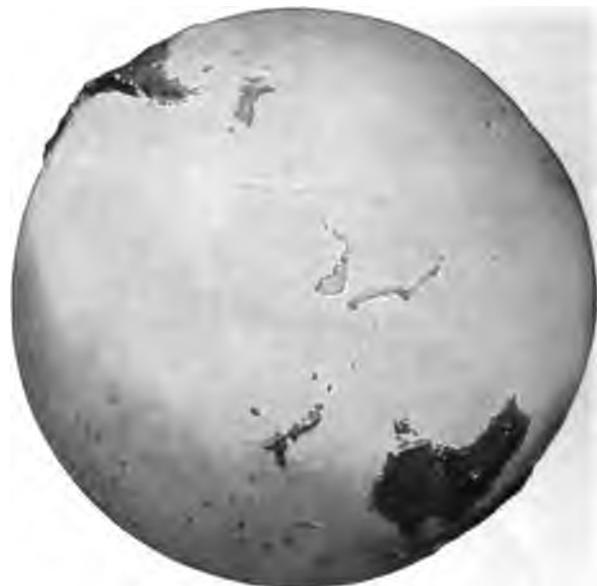
We are more interested in the land surface than in the water surface of the earth, for it is on the land that we make our homes. This visible part of the solid earth we know as the *land*. The larger part of the land area of the world is in the Northern Hemisphere. It is possible to hold the globe so that the visible half contains nearly all the land and the other half nearly all the water. (See Figs. 23 and 24.) Thus we may divide the world into the *Land Hemisphere* and the *Water Hemisphere*. (See Figs. 25 and 26.) The center of the land half, or the *Land Pole*, is near London, England, and the *Water Pole* is exactly opposite, near New Zealand. Thus England is in the center of the great inhabited land area of the world, and New Zealand lies in the vast uninhabited water region.

Continents and Islands. The land of the world is mostly in a few great masses known as *continents*, though some of it is scattered over the world in smaller masses known as *islands*. (See Figs. 25 and 26.) In many places the land of the continents extends off shore for several miles to an edge where the depth of the ocean increases suddenly. These great shallow areas are known as *continental shelves*, because they are really parts of the adjoining continents. (See Fig. 173.) Islands rising above a continental shelf, like the island of Great Britain, are known as *continental*

FIG. 25. *The Land Hemisphere.*

islands to contrast them with the *oceanic* islands which rise above the ocean water far from any land, and with the islands lying close to the coast, but separated from it by extremely deep water. The Pacific Ocean is thickly set with small oceanic islands, and Madagascar is a good instance of an oceanic island close to a great continent.

Surface of the Continents. An area of land is not called a continent, however, merely because of its size, but also because of the arrangement of its surface features. All the greater land masses are made up of highlands and lowlands, and the highest highland in each case is nearest to the greatest ocean. The land, therefore, slopes gradually downward from the highest highland toward the smaller oceans. In many cases there is a smaller highland which interrupts the lowland, as in North America where we

FIG. 26. *The Water Hemisphere.*

have the great Cordilleran Highland on the west, and the smaller Appalachian Highland rising slightly above the great lowland of the eastern part of the continent.

According to this description we have five continents — North America, South America, Eurasia (Europe and Asia), Africa, and Australia. (See Figs. 7 and 8.) Eurasia is, for convenience, often called two continents, but it is really one great land area. A few years ago Australia was called an island by some geographers, and a continent by others. As it fits the description given above, however, it is now called a continent by everybody.

The Ocean. Surrounding the land masses of the world is the great body of salt water, the *Ocean*, of which we have already spoken. While the surface of this water area is continuous, and vessels can go from one seaport to another, the continents so divide the mass

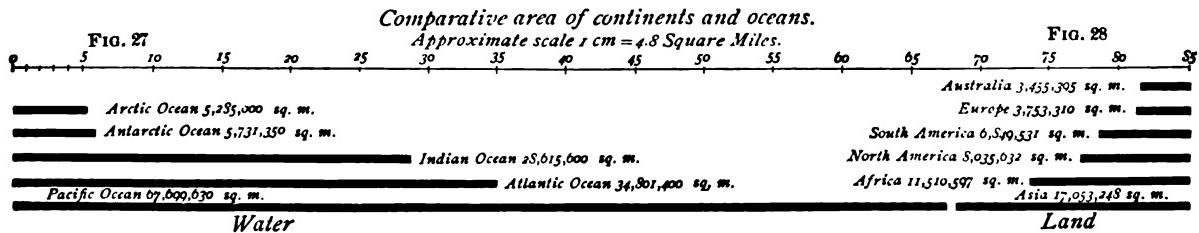
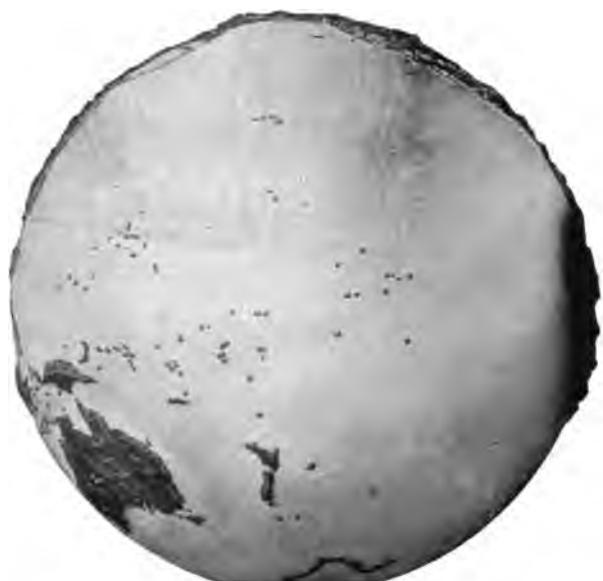


FIG. 29. *The Atlantic Ocean.*

into more or less separate basins that, for convenience, these basins are called different oceans. (See Fig. 98.) The great oceans are the Pacific, the Atlantic, the Indian, the Arctic, and the Antarctic. Certain arms of these oceans are so surrounded by land that they are known as *Seas*, like the Red Sea or the Mediterranean Sea. (See Figs. 29, 30, and 31.)

Ocean Eddies. The water of the oceans and seas is commonly in motion in a series of *currents*, due in part to the effect of the wind blowing constantly over their surface. The currents of the oceans, however, differ in their direction and character from those in seas. The currents in the seas depend on the amount of water received from inflowing rivers as compared with the amount lost by evaporation. The Mediterranean Sea, for instance, loses more

FIG. 30. *The Pacific Ocean.*

water by evaporation than it receives. Hence a current flows into it from the Atlantic through the Straits of Gibraltar. The conditions are reversed in the Baltic Sea.

In the ocean the surface water is continually in motion in a great circling eddy, which follows a very definite path. In both the Northern and Southern Hemispheres the currents move from east to west in low

latitudes and from west to east in higher latitudes. (See Fig. 98.) Thus the eddy moves in the direction of the hands of a watch in the Northern Hemisphere and in the opposite direction in the Southern Hemisphere.

In order to be accurate, therefore, we must divide the Atlantic, the Pacific, and the Indian oceans each into two oceans, according to whether they are in the Northern or Southern

FIG. 31. *The Indian Ocean.*

hemisphere, because each has a separate eddy in each hemisphere. The Antarctic Ocean moves regularly in a great eddy about the south pole and so is an ocean; but the Arctic Ocean, so called, is not an ocean, as it does not fit the pattern. It is merely a sea which has been called an ocean for so long that we must use the same name, though we know it is not correct. We shall find out more about the movements of water in the seven oceans when we study ocean currents.

Let us now study more about the land on which we have our homes and from whose soil we get our food, our materials for clothing, and our wood or bricks or stone from which we build our houses.



FIG. 32. A flat plain in South Dakota, where the slope is very gentle.

Questions and Exercises

- (1) Name two *continental* islands off the west coast of Europe; two off the north coast; two off the east coast of Asia; three off the east coast of North America. (2) Name two *oceanic* islands in the Atlantic; three in the Pacific; two in the Indian Ocean. (3) To which class do the following islands belong: Tasmania; Cyprus; the Bermudas; Trinidad; Iceland? (4) Toward which ocean does the great lowland of each continent slope? (5) Name the five continents in the order of their size. (6) What continents lie in the land hemisphere? What continent is in the water hemisphere? What effect should its position have on its commerce? (7) Fill out the following chart by consulting a map of the world and the maps of the various continents:

OCEAN	Arms	Continents entered
Atlantic ...		
Pacific.....		
Indian.....		
Arctic		

VI. RIVERS AND RIVER VALLEYS

The Landscape. The landscape which we see about us is made up of slopes, over which we travel, and down which the water runs after a rain, seeking lower ground. These slopes are parts of river valleys. In some places we find the slopes are steep and long. We then describe the country as being hilly or mountainous. In others the slopes are very gentle, and we say the land is flat and like a plain. (See Fig. 32.) No two regions are exactly alike, however, for the slopes to be seen in one landscape are not like those in another. It is the variety of landscape that gives beauty to a region and makes traveling pleasant.

Wherever we go we find slopes and valleys, and in most valleys we may see flowing rivers along which people live

and build their towns and cities. Rivers help to change the slopes of valleys; they are of service in turning mill wheels, in supplying water to the soil, and to reservoirs of cities, and as waterways for commerce. Rivers and river valleys should therefore be studied with care.

The Formation of Rivers. If we go where two slopes meet at their lower edges, in time of rain we shall find a stream of water, just as water flows down the line where the sloping roofs of two houses join. Such a stream we ordinarily call a *brook*, a *creek*, or a *rill* if it is small, and a *river* if it is large. In some cases the water is clear and beautiful; in others it is muddy and brown. The muddy color is due to particles of *detritus* which the water is carrying away from land. If the detritus is large, we call the pieces *boulders*; small stones we call *gravel*; small, sharp, hard fragments are known as *sand*, while fine, soft, light, black, brown, or gray

particles which float in the water are called *mud* or *clay*.

The clear stream also carries detritus away from the land, even though none may be visible rolling along the bed. Some of the clearest streams in the world contain a great quantity of earth material dissolved in the water. This material is common salt and many other easily dissolved substances which are secured from the rocks. These *salts*, as they are called, are carried out to the ocean and give it its saltiness. Where the slopes are steep, as they are in many mountainous regions, the pieces of rock carried along may be so large and heavy that they bang together, making a crackling sound, which can be heard above the noise of the fast-flowing water. (See Fig. 33.)

What a River Is. Every stream of water carries along detritus as it flows through the land, and the detritus is as much a part of the stream as is the water. Hence we need to think of a river, not as water merely, but as a *stream of water and detritus moving through the land*. The water and the detritus are moving down hill toward the lowest part



FIG. 34. *The Platte River in Nebraska during a dry period. There is more detritus than water showing.*

of the earth's surface, which is the ocean. In dry regions the amount of water moving down the slopes may be very small, and the detritus may be more conspicuous than the water, while in other cases, as we have seen, the detritus is invisible. Thus the proportion between the water and the detritus may vary greatly in different regions. (See Fig. 34.)

River Basins and Systems; Divides. All the land whose surface water and detritus are moving toward the ocean down one great river we call the *basin* of that river. All the streams which combine to make one great *main* or *master* stream we call a *river system*. (See Fig. 36.) Each of the smaller streams which *contributes* water and detritus to the master stream is a *tributary*. (See Fig. 36.) As there is no region which does not have slopes, river basins are found everywhere over the earth.

As we climb the slope from a stream toward its head, we finally reach a point from which the land slopes in at least two directions. If we try to go from one river basin to another along any line, we always pass over a point from which the water could flow in either direction. The line marking off one basin from another is known



FIG. 33. *A river in Switzerland, showing boulders carried in time of flood.*

as a *divide*. During a rainstorm it divides the water going down one slope from that going down the neighboring slope, as the ridgepole of a house does. (See Fig. 35.)

The Work of Rivers; Valleys. As the running water moves through the land it continually changes the form of the land by removing materials from the surface. Thus a river is doing work, for it is gathering up rock detritus and carrying it away. A river works more rapidly where it flows quickly and more slowly where it flows gently. Therefore, streams wear the land away most rapidly near their heads. Here they cut sharply into the rocks much as a saw cuts a gash in a log, and form narrow, steep-sided gorges, which are one kind of *valley*. If the stream and the weather keep on wearing away the rocks, the valley will be cut deeper and broader, and more of the land will be removed, until finally all the land may be worn down as low as it can be, and still permit the streams to run down the faint slopes.



FIG. 35. Divides in a mountainous country. The highest ridges form the main divide, the lower slopes the lesser divides.

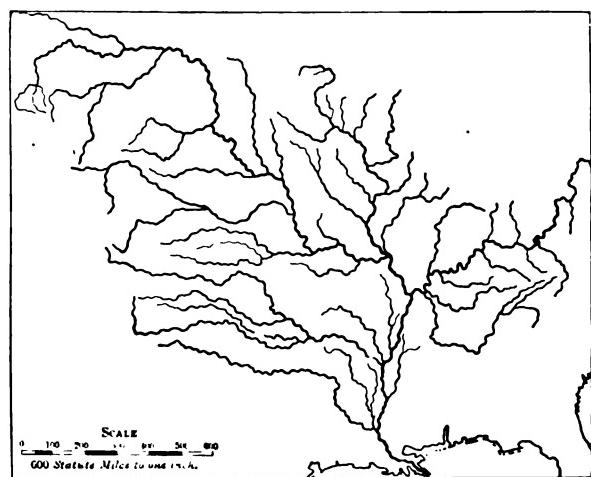


FIG. 36. The Mississippi River system, including large branches, many smaller branches, and a large extent of land surface drained.

Young River Valleys; Canyons; Water Gaps.

A river which has just begun its work we call a *young* river, because it has worn away but little of the land through which it runs. (See Fig. 37.) It has done but a small part of the work waiting to be done during its long life. A *young valley*, therefore, is a valley that has been but little worn, and is narrow in proportion to its depth. Such young valleys are usually found near the headwaters of rivers, but may be found wherever a rock wears away very slowly, so that here the river valley remains narrow, while perhaps upstream it is broad and flat.

A young valley, if it is small, is often called a *gorge*, *glen*, *ravine*, or *chasm*, and if very deep a *canyon*. The greatest young valley in the world is the Grand Canyon of the Colorado in Arizona. In places it is more than a mile deep and about thirteen miles wide in its widest portion. (See Fig. 38.) Narrow young valleys are often hard to cross, because one scrambles down one side and up the other with great difficulty. (See Frontispiece.) People do not as a rule, therefore, live in young valleys, because there are no gentle slopes on which they can raise crops or build their houses.

Sometimes a broad valley contracts for a

short distance to a narrow gorge, because of a barrier of rock or a mountain ridge. This stretch of narrow valley becomes important because all railroads, highways, and canals in the valley must pass this one point. At such points there is often a town. These short, young valleys are often known as *water gaps*, like the Delaware Water Gap in New Jersey and Pennsylvania, or the gap of the Potomac at Harpers Ferry. (See Fig. 39.)

Waterfalls and Lakes. When a river is young, its course in the mountains and hills is often irregular. In places it bounds along in *rapids*, or it may leap over cliffs or down very steep slopes, forming a *waterfall*. (See Fig. 41.) A great waterfall like that of Niagara is often known as a *cataract*. A fall made by a small stream leaping a great distance is commonly called a *cascade*. Many of the cascades in the White Mountains of New Hampshire are famed for their beauty the country over.

In some places the water finds a barrier in its course, behind which it must accumulate before it can flow over the edge. Then it forms a quiet stretch of water known as a *lake* or *pond*. (See Fig. 42.) Water may flow into the lake by several streams known

as *inlets*, but as a rule it flows out at only one place, the *outlet*. In some regions lakes also occur in basins in the ground and have no outlet. If such a basin should fill up, the water would flow over the lowest point in the bounding rim and a stream would be formed.

The Uses of Lakes and Waterfalls. Lakes and waterfalls are often helpful to us. Waterfalls are sometimes so beautiful or grand that people travel great distances to see them. The force of the falling water is frequently used to turn wheels, to give power to mills, and to operate dynamos and other machines. A portion of the power of Niagara is now used to develop electricity for heating and lighting in the city of Buffalo, twenty miles away.

Lakes also may be noted for their beauty, and their leeward sides are frequently chosen as sites for summer homes and camps. Large lakes or long narrow lakes are much used as



FIG. 37. Ausable Chasm, New York. A young valley in which the stream is cutting rapidly.

lines of travel and commerce, because water transportation is usually cheaper than land transportation.

The greater part of the traveling and exploration in very early days was by way of lakes and rivers. The Great Lakes and Lake Champlain especially were used by the early missionaries and explorers. The American

Indians of the eastern states were famous for their skill in managing a canoe, and on many of the rivers and lakes of the northern states Indians still get their living largely by acting as guides for travelers and sportsmen.

Lakes are useful in another way. They act as filters for the streams that

flow into and out of them. The detritus brought into the lakes settles to the bottom, and the water flows from the lakes clear and beautiful. This is well illustrated by the St. Lawrence River, which is very clear where it flows out of Lake Ontario. The fine detritus deposited on the bottom of a lake and the accumulated vegetation gradually fill it up, until, in the course of time, it is changed into a marshy spot covered with trees and plants and known as a *swamp*, or even into firm land suitable for farming. (See Fig. 42.) There are thousands of such places in our north-eastern states which were formerly small lakes.

Whenever a large lake has dried up or been drained, as sometimes happens, the bottom or floor forms a flat plain, and usually makes fertile farming



FIG. 38. A canyon. A general view of the Grand Canyon of the Colorado.

land. The great wheat fields and flax fields of Minnesota, North Dakota, and Manitoba are in the basin of a great lake known as Lake Agassiz, which has long since disappeared.

Questions and Exercises

- (1) Where have you seen a brook?
- (2) What sort of detritus was it carrying away? (3) Toward what ocean was it moving? (4) Study the picture of the Swiss river in this chapter. (5) Does it carry much or little detritus? (6) How is it different from the brook you have described? (7) Locate on a map some river you have seen. (8) Of what use is this river to the people who live near it? (9) To what river system does it belong? (10) Trace on the map a divide between this river basin and a neighboring basin; between two tributaries of the same river. (11) Have you ever stood on a divide? (12) Where was it? (13) Trace the divide between the Mackenzie and the Yukon; the Arkansas and the Red rivers. (14) Write in one column the chief river systems of North America; in another those of Africa; in another those of Asia. (15) Study the pictures of young valleys in this chapter. (16) Draw a cross-section of Ausable Chasm. (17) Is the valley wider at the top or at the bottom? (18) Can you tell why? (19) What is the difference between a gorge and a chasm? (20) What railroad passes through the Royal Gorge of the Arkansas? (21) What were



FIG. 39. Tyrone, Pennsylvania, built on a broad plain at the end of the water gap of the Little Juniata River.

some of the difficulties of building a railroad along this river? (22) Locate on your map the Delaware Water Gap. (23) Why should a railroad pass through this gap? (24) Give one reason why a town is likely to grow up at such a water gap.

(25) Draw Lake Winnipeg with its inlet and outlet. (26) On the same sheet of paper draw a map of a lake you have seen, with its inlet and outlet. (27) Which part of a lake, the head or the foot, generally begins to fill up first? (28) What plants are often found in the marshy parts of lakes? (29) Study the picture in this chapter that shows a filled-in portion of a lake; why would this make good farming land?

(30) Name six lakes in North America that are used for transportation; two in Europe. (31) Name and locate three lakes noted for their scenic beauty. (32) Name four lakes which lay in the routes of early explorers of our country.



FIG. 40. Diagram of a rapids where the water of a lake flows out over strong rock.

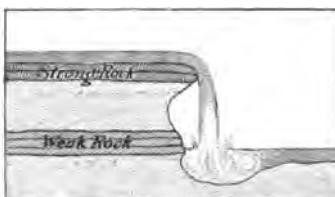


FIG. 41. Diagram of a waterfall.

populated, because many people can secure a living on their pleasant slopes and rolling surfaces. (See Fig. 43.)

A mature valley generally has but few lakes, because the stream by this time has succeeded in wearing down the barriers in its course, so that it can flow freely. There may be occasional waterfalls, however, where some unusually strong barrier exists.

Sinks. In those regions where the underlying rock is limestone, the water frequently dissolves away the rock, forming small basin-like bowls. The water flows from all sides toward these holes in the ground, and sinks out of sight. Such basins are commonly known as *sinks*. The water from these sinks runs along underground



FIG. 42. A New England lake gradually filling up with detritus and decaying vegetation.

and sometimes reappears miles away as a large spring. Such rivers are sometimes known as *lost rivers*. If the outlet to a sink becomes closed, the water accumulates, forming a lake. There are many such sink regions and lost rivers in eastern Tennessee and northern Alabama.

Deposits in Mature Valleys; Alluvial and Flood Plains.

The slopes in a mature valley are more gentle than those in a young valley, and along the main stream they often take the form of a

VII. RIVERS AND RIVER VALLEYS (Continued)

Mature River Valleys. As young valleys grow old and are worn into more and more gentle slopes, the valleys become valuable for occupation if located where people can live. A broad, middle-aged, or *mature* valley, like the Shenandoah Valley, is often devoted to farming, and has railroads and highways. Mature valleys are often thickly



FIG. 43. A farm scene in a mature valley.



FIG. 44. *The old peneplain of New England, as it appears in New Hampshire.*

flat plain. Such plains are known as *alluvial plains*. They have been built up out of the detritus that the stream, owing to its lack of force, could not carry farther. (See Fig. 46.) If alluvial plains are flooded at times of high water, as often occurs, they are called *flood plains*. (See Fig. 45.)

These plains, because of their fine soil, level surface, and nearness to water, are frequently good farming regions. If narrow and bordered by steep slopes, they furnish perhaps the only route that carriage roads and railroads can follow.

The alluvial plain of the lower Mississippi is one of the largest and most important river-made plains in the world. (See Fig. 47.) Almost any small stream, however, will have small patches of alluvial plain along its course.

Alluvial Fans. When a tributary stream flows from the steep side of a valley onto the gently sloping floor of the main valley, its force is suddenly weakened, and it deposits a large amount of the detritus it is carrying. This detritus is usually built up in the form of a *cone*, pointing into the mouth of the tributary, and extending out in an even slope into the main valley. These cones are shaped some-

what like an open fan, and are therefore frequently called *alluvial fans*. Oftentimes the tributary divides and flows down over the face of the cone in several channels, called *distributaries*, because they scatter the water and detritus in many directions.

Alluvial fans are particularly abundant in the dry regions of the world where the rivers have little volume and force. They may often be seen after a rain beside a gutter stream which has received side streams carrying much detritus.

Old Valleys. As the rivers go on wearing away the land, they gradually reduce the slopes until the region becomes very flat, with just enough incline to make the rivers run. Then a river and valley may well be called *old*, for most of the land to be worn away has already been removed. Alluvial plains abound in the lower portions of old rivers,

because the force of an old river is not great enough to carry away the large amount

of detritus brought down by the tributaries. The lower Ganges-Brahmaputra and the lower Mississippi are both old rivers. If the streams in a large part of a country should all become old at the same time, the whole

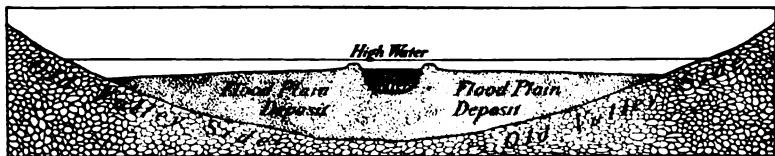


FIG. 45. *Diagram of a flood plain.*



FIG. 46. *The Charles River near Cambridge, Mass. An alluvial plain built up from the detritus of the winding river in the distance.*

region would be worn down almost to a plain lying but little above the level of the sea.

Peneplains. At several times in the distant past the streams of the eastern part of our country have worn their valleys to such a plain-like form. We do not find many evidences of this condition, however, in the present rivers of the world. Such an old region, worn down *almost to a plain*, is known as a *peneplain*.

Peneplains occur in many parts of the world now, but they have been elevated since they were formed, and new valleys have been cut in them, so that we can see the peneplain only by climbing to the tops of the ridges. Then we find that all the ridges lie at approximately the same height, showing the former extent of the peneplain. The upland of New England above which the higher peaks rise only a few hundred feet is one of the best known peneplains in the world. (See Fig. 44.)

Monadnocks. If any one has seen a wooden floor worn almost through, he can easily imagine how elevations are formed on the land by the wearing away of the rocks. In such an old floor little elevations will often be left where there was a knot in the boards, or perhaps a nail. In the same way

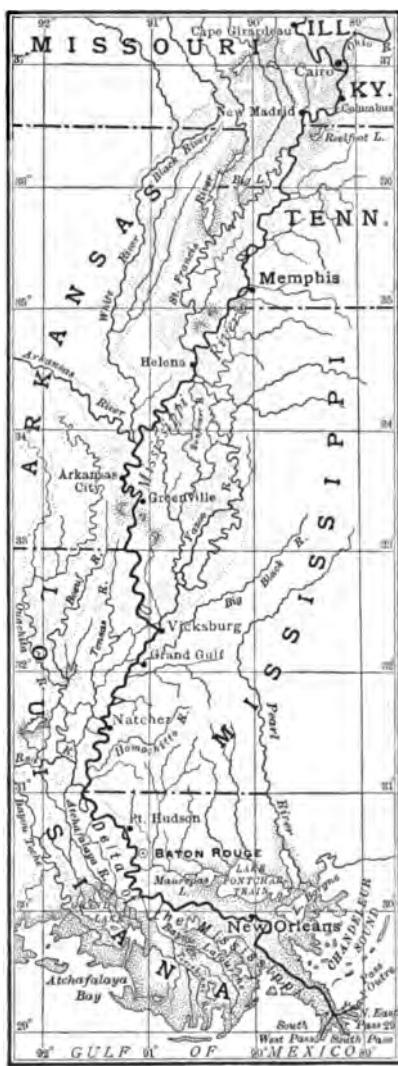


FIG. 47. A map of the Mississippi flood plain.

any particularly strong point in a region will persist when the neighboring country has been worn down to a peneplain. Such elevations are known as *monadnocks*, because they rise above the old peneplain surface, as Monadnock Mountain in New Hampshire rises above the old peneplain which may now be seen on the neighboring hilltops.

Meanders. A very old river usually has a large alluvial plain, a part of which may be a flood plain. As the slope of the river is gentle, and the water consequently flows slowly, it can carry only the finest detritus. Thus the particles forming an alluvial or flood plain in an old valley are extremely fine, and the soil is excellent. When a river flows so slowly and quietly, it cannot follow a straight course, as most young rivers do, but is turned from its path by the slightest obstacle; hence it follows a winding, snake-like, or meandering course. (See Fig. 48.) The different curves are called *meanders*, because

they are like the curves of the Meander River which flows through Asia Minor.

In a meandering stream the water is deeper

and swifter on the outside of the curves than it is on the inside. The river often cuts into its shore on the outside, forming a steep bank,



FIG. 48. A meandering stream.

while the inside shore slopes gently. Sometimes the meanders become so close together that finally the land separating them is cut through, thereby straightening the river. The meanders are then left as lakes in the shape of horseshoes, with the open side of the horseshoe facing the river. Such lakes are made by the river as it develops, and are very numerous in large, old rivers like the Mississippi. They are sometimes known as *oxbow* lakes, and the new stretch of river cutting across the neck of a meander is commonly called a *cut-off*. (See Fig. 49.) A cut-off often shortens the course of a river by many miles. Oxbows only make navigation the more difficult, and cut-offs are of little value, as they are usually made in streams that have a continually shifting channel.

Population in Old Valleys. Old river valleys, in countries where the climate is favorable, are, as a rule, occupied by farms, and often support a dense population. The most densely inhabited regions in the world are the old river valleys of southeastern Asia.

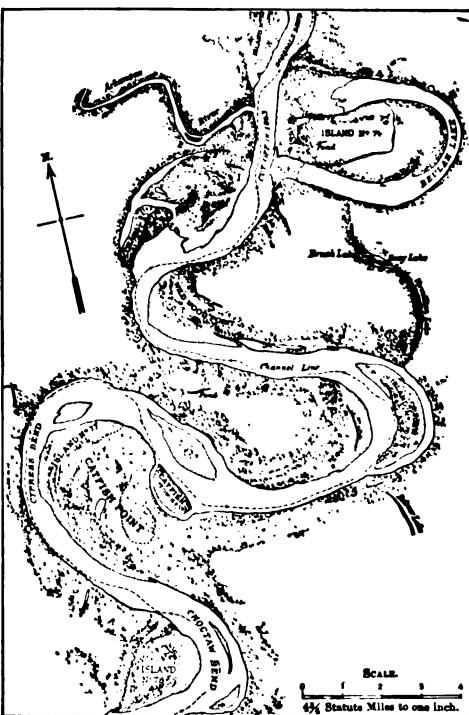


FIG. 49. A portion of the Mississippi River, showing meanders and an oxbow lake.

These regions, like the old valley of the Nile in Africa, or the Ganges-Brahmaputra in India, are famous because they have supported dense populations for a long period of time.

Deltas. Where a river flows into the ocean, or any body of standing water, such as a lake, or even into a quiet stretch of a larger river, most of the detritus is dropped near the mouth of the stream, thus building the land gradually into the water, and forming a *delta*, so named because of its resemblance to the Greek letter Δ . (See Fig. 50.) The deltas made from the detritus brought by old rivers are flat, and made of

very fine materials. Those made by a young river are often steeper in their slope, and made up of coarser material, like sand and gravel.



FIG. 51. The coastal margin of the Mississippi delta, showing how the land is built into the water.

The main stream frequently divides at the head of the delta and flows across it in several distributaries, as in the case of alluvial fans. The deltas of the Nile, the Ganges-Brahmaputra, and the Mississippi are very large, and have many distributaries. (See Fig. 51.)

Drowned Valleys. The land is slowly rising or settling in many parts of the world, and rivers flowing across such a rising or settling region are changed in many ways. It is not

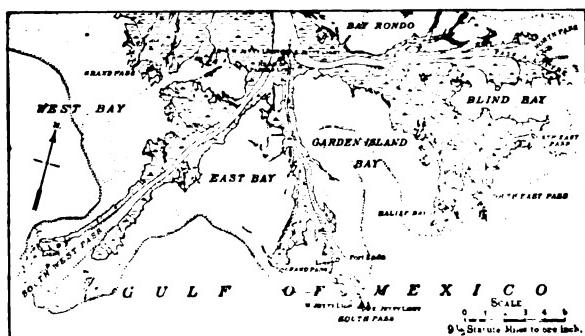


FIG. 50. The lower delta of the Mississippi River.

easy to study the changes produced by an elevation of the land. We can easily see the effects of settling, because as the land slowly sinks, the ocean water gradually fills up the river basins, so that the portions of the valleys which were formerly above water are submerged and no longer visible. We say that such valleys have

been *drowned*. (See Figs. 52, 53, and 54.)

If an old or mature valley is drowned, we have a broad arm of the sea, irregular in outline, into which flow many separate streams, formerly tributaries of the drowned master stream. Such drowned valleys are known as *estuaries*, and are very helpful in commerce because they usually form good harbors. (See Fig. 54.) The estuaries of Chesapeake Bay and the Hudson River and of San Francisco Bay are good illustrations of drowned valleys which are commercially of great importance.

If the river valley is narrow and young when it is drowned, we have a steep-walled,

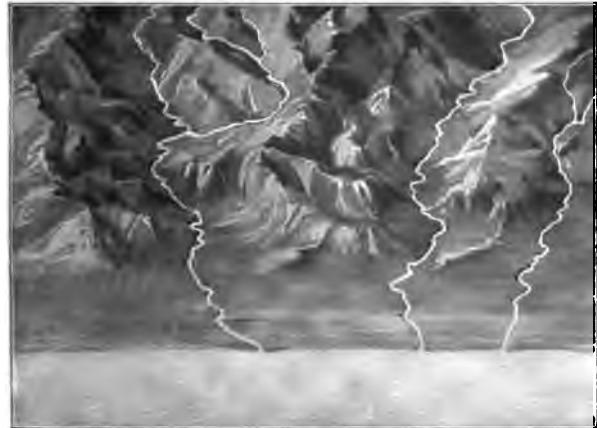


FIG. 53. Mature river valley, bordering a low coastal plain.



FIG. 52. An estuary in New Brunswick formed by the drowning of a small mature valley.

narrow valley known as a *fiord*. (See Fig. 55.) Fiords are often very beautiful, because of the rugged scenery about them, but they are not important in commerce because few people can live along the sides of such drowned valleys. The fiord of the Saguenay River, in Quebec, is one of the most beautiful in America, though

there are many well-known and splendid ones along the coast of British Columbia and Alaska. The coasts of Norway, of southern New Zealand, and southern Chile are also indented by magnificent fiords.

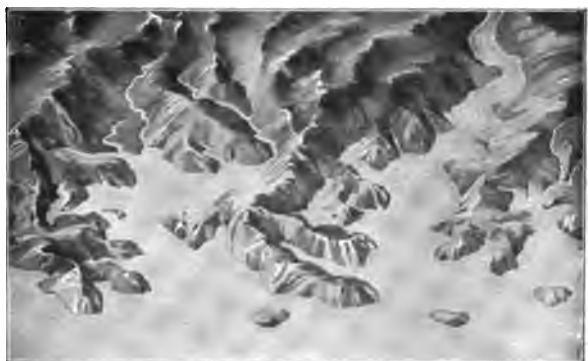


FIG. 54. The plain and the valleys seen in Fig. 53 after being drowned.

Hills and Valleys. As the rivers wear down the land about them, forming valleys, the stronger rocks, which are worn away more slowly, are left rising above the gentle slopes, often in isolated elevations known as *hills*. A hill, therefore, is a small part of the land that has not yet been worn down as low as the rest of the region. We shall see later that, as the land wears away, very high elevations, or *mountains*, are sometimes left between river valleys.

Questions and Exercises

- (1) Examine the picture of a mature valley in this chapter. What can you say of its slopes, of its fitness for farming, for supporting a large population? (2) What is the character of the detritus carried by a mature river? (3) Why cannot such a river transport large boulders? (4) Tell how a river builds up its flood plain. (5) Why should such plains generally be good farming land? What dangers may threaten people living on such plains? (6) Locate the Mississippi flood plain; the Rhine flood plain; name two cities on each. (7) Which streams bring most detritus to the Mississippi, those from the east or those

- (15) Name and locate five important deltas of Asia and name a city in each. What is the chief delta city of the Volga? Of the Rhine? Of the Rhone? (16) Name and locate five estuaries in North America which admit large vessels.

VIII. PLAINS, PLATEAUS, AND MOUNTAINS

What Plains and Plateaus Are. A great part of the surface of the world is composed of plains or plateaus, on which a large proportion of the people of the world live. On a plain there are generally few elevations rising above the prevailing level of the country, the slopes are gentle, and, if the plain is not wooded, extensive views can be obtained in almost any direction.

A plain may be hundreds of miles in extent or it may contain only a few acres. (See Fig. 56.) In every case it either slopes gradually down to lower land



FIG. 55. A Norwegian fiord formed by the drowning of a young valley.

from the west? Why? (8) Find portions of the Mississippi that meander. (9) Do you find meanders near the sources of rivers? Give the reason. (10) How many cut-offs do you find in Fig. 49? (11) What hindrances to navigation does such a river present? (12) Find out something interesting about the Mississippi flood plain; its cut-offs; its oxbow lakes. (13) How far up the Mississippi can ocean steamers go? What city is located there?

(14) Make a list of the chief cities on the Nile, the Ganges, the Yangtse-kiang, and the Mississippi, and place opposite each its population. Write below this exercise your reasons why these river valleys should support such a dense population.

or water, or it is bordered by the somewhat steeper slopes of hills or mountains as are some of the western plains of the United States.

A plateau is characterized by slopes similar to those of a plain, but it often has a greater number of elevations rising above the general surface of the country. A plateau usually drops *abruptly* on one or more sides to lower land. The Cumberland Plateau in the southern Appalachian Mountains descends to the lower land to the east in a bold *cliff* or *escarpment*, in some places more than a thousand feet high.

Owing to the evenness of the surface of a plain or plateau, it is often impossible to tell from the top of the region whether it contains any

river valleys, so sharply are these sunk beneath the plain. Owing to the great altitude of a high plateau the rivers have a chance to cut deep valleys before they reach low levels. These river valleys often have nearly vertical sides, and by examining them we learn that the layers of rock in a plain and plateau are usually almost horizontal. The deepest and most wonderful river valley in the world is the Colorado Canyon, already mentioned, which has been cut into the Colorado Plateau in Arizona. (See Figs. 38 and 57.)

Low plains, in regions where the climate is favorable, are very productive and are densely inhabited. But many plateaus are so high that their climate will not permit of farming. These are often occupied, however, by people who are engaged in grazing. On both plains and plateaus the slopes are so gentle that if there are no deep river valleys to be crossed, roads and railroads can be built with equal ease in almost any direction. For this reason, in a newly discovered country, people rapidly occupy the plains,



FIG. 56. *A broad plain in Kansas.*



FIG. 57. *The plateau of the Colorado Canyon.*

where they can spread out and have plenty of room, as was illustrated in the occupation of the Great Central Plain of the United States.

Mountains. Every continent contains a certain area that rises into a great highland known as a *mountain system*. A mountain system is usually made up of several nearly parallel series of heights known as *mountain ranges*, each of which usually has many points or *peaks*, rising somewhat sharply above the rest of the ridge. (See Fig. 58.)

Any height rising sharply to a considerable altitude above the surrounding region is commonly known as a mountain. The term mountain, however, is more properly applied to any region in which the rocks have been folded or turned on edge. (See Fig. 59.) During the folding and wrinkling of the earth the rocks may have been greatly heated so that they

have lost their original appearance. Every boy knows how a piece of iron can be made warm by pounding, and can therefore understand how the rocks of a mountain may be heated by being pressed together.

We know very little about the reasons for mountain building, but we know that



FIG. 58. *A mountain range in the Pyrenees, showing peaks rising in the distance.*



FIG. 59. Rocks, on the coast of Cornwall, England, showing how pressure forms mountain folds.

mountain ranges are continually rising, just as we know that the continents are continually rising or settling. As a mountain range rises, it begins to be worn down, as are all land forms, and in this way furnishes detritus for the rivers to carry away. Thus the mountain peaks we see are but a part of the mass of rocks formerly existing there.

The Relation of Mountains to Man. Mountains usually contain many steep and long slopes, and are so rugged that they are often hard to travel through. Railroads and highways are built with difficulty across mountain districts. In some cases tunnels many miles in length have to be constructed for railroads to pass from one side of the range to the other. Mountains have always been barriers, hemming people in and keeping them from readily occupying the area beyond.

From the standpoint of commerce or travel, therefore, the important parts of a mountain system are the lowest points in the crests or ranges where people can get over most easily. Such low *gaps* or *passes* have always

been of great importance. (See Fig. 60.) In certain parts of our country, roads or trails were made through these natural gateways by the Indians and buffaloes that formerly occupied the region. In many cases, as for instance in West Virginia, these early paths are now used for railways or highways.

The high peaks are usually avoided except by those who wish to ascend them for the pleasure of mountain climbing, or for the view to be gained from them. As the air on mountains is always thinner and purer than that on the lower plains, these highlands are visited by many people in search of health or for pleasure, particularly in the summer time.

The highest peaks in the world have their summits covered with snow. (See Fig. 58.) Most of the other mountains are covered by forests, and are the homes of certain wild animals which can climb over the rocks and the steep slopes with ease. Therefore, mountains are often

visited by hunters in search of big game. Some mountains contain valuable minerals



FIG. 60. A mountain pass in Norway.



FIG. 61. A mining town in Colorado.

like gold, silver, and copper, and hence mining towns have sprung up in regions that never would have been occupied otherwise. (See Fig. 61.) Leadville and Cripple Creek, Colorado, are examples of such mining towns. Farming is impossible in mountain regions, except on the plains found in the occasional valleys lying between the ridges.

Questions and Exercises

- (1) Locate the chief plains of North America.
 (2) Draw a sky line of a plain; of a mountainous region. (3) Why will the region of the Colorado

Canyon never
be densely
populated?

(4) Name
plains of
North Amer-
ica that are
thickly pop-
ulated; of Eu-
rope; of Asia.

(5) Would you
rather live on
a plain or in
a mountain
valley? Why?

(6) Name
and locate
five mountain
ranges in Asia;
five in Europe;
ten in North
America. (7)
Describe some
mountain
peak you have

seen or know from a picture. (8) Name and locate six peaks in the United States; six in Europe; four in South America. (9) Read about the ascent of some famous peak and describe it to your classmates. (10) Study the picture of a mountain fold in Cornwall; what part of this fold has been worn away?

(11) What mountain ranges in the United States formed a barrier to the early settlers? Name and locate three passes in this mountain wall. What occupies these passes to-day? (12) Name and locate three famous Alpine passes in Switzerland. Into what country does each lead? (13) By what pass does the Union Pacific Railroad cross the Rocky Mountains? By what pass does the Southern Pacific cross the Sierra Nevada? (14) Name and locate four mountain groups in North America that are pleasure resorts.



FIG. 62. An irrigated field in Kansas.

IX. UNDERGROUND WATER

Ground Water and Run-off. Only a certain part of the rain that falls runs down immediately toward the sea in rivers. A good deal of it is dried up or evaporated, and much of it soaks into the ground, becoming what we know as *ground water*. The cracks in the rocks are filled with water to very great depths.

It is this ground water soaking through the soil that feeds the plants and the trees. In all farming regions, therefore, it is important

to know how large a part of the rainfall will immediately run off, and how much will soak into the ground. The portion that immediately runs off is known as the *run-off*. Some soils, especially if they are sandy, will take up

water much more readily than others. Regions that are covered by forests or grass do not have as great a run-off as those that are barren of vegetation.

In regions where the run-off is very great the water is sometimes held back in large artificial reservoirs and fed out to the land as needed. This watering of the land, either with the water thus stored up or with water pumped from deep wells beneath the ground, is known as *irrigation*. (See Fig. 62.) Many regions, like parts of southern California and Spain, that would otherwise be deserts, have become fertile garden spots through irrigation.



FIG. 63. *The interior of a cave in New South Wales.*

Wells and Springs. It is the underground water soaking through the soil, that accumulates in a hole dug in the ground and forms a *well*. When the ground water finds its way to the surface again, as it often does, we have a *spring*. Every spring is one of the sources of some river which drains the region in which it is located. Every river has many such sources.

Caves. Limestone rocks are easily dissolved by water, so that in limestone regions much of the water often runs along beneath the surface, dissolving out an underground channel and forming what we know as a *cave*. The cave water finally comes to the surface again at a lower level, and flows on as a river. Some of these caves are very large and have miles of underground passages. (See Fig. 63.) The Mammoth Cave of Kentucky is one of the best and largest examples in the world.



FIG. 64. *A hot spring deposit in Yellowstone Park. The minerals in solution in the heated water gradually build these beautiful deposits.*

In the course of time a large part of the roof of a cavern may fall in, leaving perhaps one section in the form of a *natural bridge* crossing from one side of the valley to the other. Natural bridges are formed also in several other ways, but one of the most noted, that of western Virginia, on the headwaters of the James River, has been formed in this way.

Questions and Exercises

(1) What may be two reasons why the region pictured in Fig. 62 has to be irrigated? (2) What soils take up water readily? (3) What is a well? A spring? Describe a spring you have seen. (4) Is there much or little run-off where you live? How does the character of the soil affect this?

(5) What is the character of the soil about your home? (6) Does the rain soak into the soil easily? (7) Are wells common?

(8) Are the slopes in your vicinity covered with trees? How does this affect the run-off? (9) Why should the United States government wish to keep great forest areas from destruction? (10) Name some regions in the United States that have been made fertile through irrigation. (11) Where does the water in the reservoirs in these cases come from?

(12) Why is it necessary to irrigate vineyard slopes in Switzerland where the rainfall is moderately heavy? (13) Why is irrigation necessary in the Po Valley in Italy? In the Nile Valley?

(14) How may a *natural bridge* be formed in a limestone region?

On a seashore? (15) Describe one you have seen pictured. (16) Locate Mammoth Cave; Luray Cavern; Natural Bridge. Tell how these caves were formed. Have you ever seen a cave that was not formed in the way these caves were? Tell about it. Find out about the animals of Mammoth Cave.

X. VULCANISM

Hot Springs. In some regions of the world the water which has soaked into the ground comes to the surface again very much heated. This is because the interior of the earth is hot, and the water has penetrated far enough to become heated, even to the boiling point. When this water flows quietly to the surface like a spring we call it a *hot spring*. (See Fig. 64.)

Many places in our country are famous for their hot springs. Numerous hot springs exist in the Yellowstone National Park, in Arkansas, Colorado, Virginia, and some other states. Some hot springs bring to the surface water that is full of dissolved minerals, which make the water beneficial for people suffering from certain diseases. Hence, hot springs frequently become health resorts, where people go to drink or to bathe in the waters.

Geysers. In the Yellowstone National Park in Wyoming, in Iceland, and in certain parts of New Zealand, the hot waters spout out of the earth at regular intervals, forming intermittent hot springs, known as *geysers*. From some of these the water is thrown to a height of more than two hundred feet. (See Fig. 65.)

Geysers are beautiful and majestic, and some of them pour forth an enormous amount of water when in eruption. There are so many geysers and hot springs in one part of the Yellowstone National Park that the river



FIG. 65. *Old Faithful Geyser in Yellowstone Park.*

carrying away their water is appropriately named Firehole River.

The dissolved minerals brought to the surface through hot springs and geysers often crystallize again as the waters cool. Thus deposits of minerals are built up about the mouth of the geysers or springs, forming a considerable elevation above the region round about. (See Fig. 66.) Some of these hot waters contain a low form of plant life, which gives a most beautiful color to the deposits.

Volcanoes The waters that penetrate deep into the earth sometimes come to the surface again in the form of steam. The steam may be so hot that it melts the rocks through which it penetrates. Then the steam, hot water, and melted rock either flow gently out upon the surface or are blown into the air with tremendous force and to an



FIG. 66. *A cone built by the mineral deposits of a hot spring in Yellowstone Park.*

enormous height, forming a *volcanic eruption*. (See Fig. 459.)

In most eruptions a large part of the rock material poured forth falls about the opening, building up a conical peak known as a *volcano*. (See Fig. 67.) At the top of the peak there is usually a saucer-like depression, known as the *crater*. At the bottom of the crater is the opening, or *throat*, of the volcano, through

which issues the mass of steam, hot water, and rock. The melted rock is called *lava*.

In some cases the lava, instead of coming to the surface, penetrates cracks in the earth, caused by the explosive force of the eruption, and fills them up. Later, when the overlying weaker rock has been worn away, the hardened lava will be revealed. This is the history of the rocks forming the beautiful Palisades of the Hudson. When the volcanic eruption is intense the melted rock is blown out in fine particles which may be carried vast distances, falling as fine dust known as *volcanic ashes*. Sometimes the rock is only partially melted and is blown forth in large, hot masses known as *bombs* or, as great unmelted blocks of stone. (See Fig. 68.)

Perhaps the best known and most symmetrical volcano is Vesuvius. During a great eruption, nearly two thousand years ago, its ashes buried two neighboring cities, Herculaneum and Pompeii, killing great numbers of

people. During a severe eruption in 1906, Naples was deeply covered with ashes, which the winds carried across the Adriatic, and lava flowed far down the cone. The most recent great volcanic eruption was that of Mont Pelée in the summer of 1902. (See Fig. 68.)

Mont Pelée is on the island of Martinique, in the Caribbean Sea. This eruption caused an enormous amount of damage, and killed more people

than any other known volcanic explosion.

Extinct Volcanoes. When a volcano loses its energy and ceases to be active, the lava cools in the throat of the crater and forms a dense mass of solid volcanic rock. The crater, being plugged up, forms a saucer-like basin in which water may accumulate after a rain, forming a lake. In some of the volcanoes of Arizona and New Mexico which

have long been extinct there are such volcanic lakes, but the best examples are in central France, where many of them are found. In Oregon there is a famous crater lake, deeply set amid encircling cliffs of great beauty, but this lake is unlike those noted above, because it has not been formed in the same



FIG. 67. *The cone of an extinct volcano, New Mexico.*



FIG. 68. *A great block from Mount Pelée, Martinique.*

way. In this instance the whole top of the volcano peak has disappeared, and the lake lies in the depression thus formed. (See Fig. 181.)

As a volcano is gradually worn down, the ashes and lava forming the cone are worn away more quickly than the lava in the

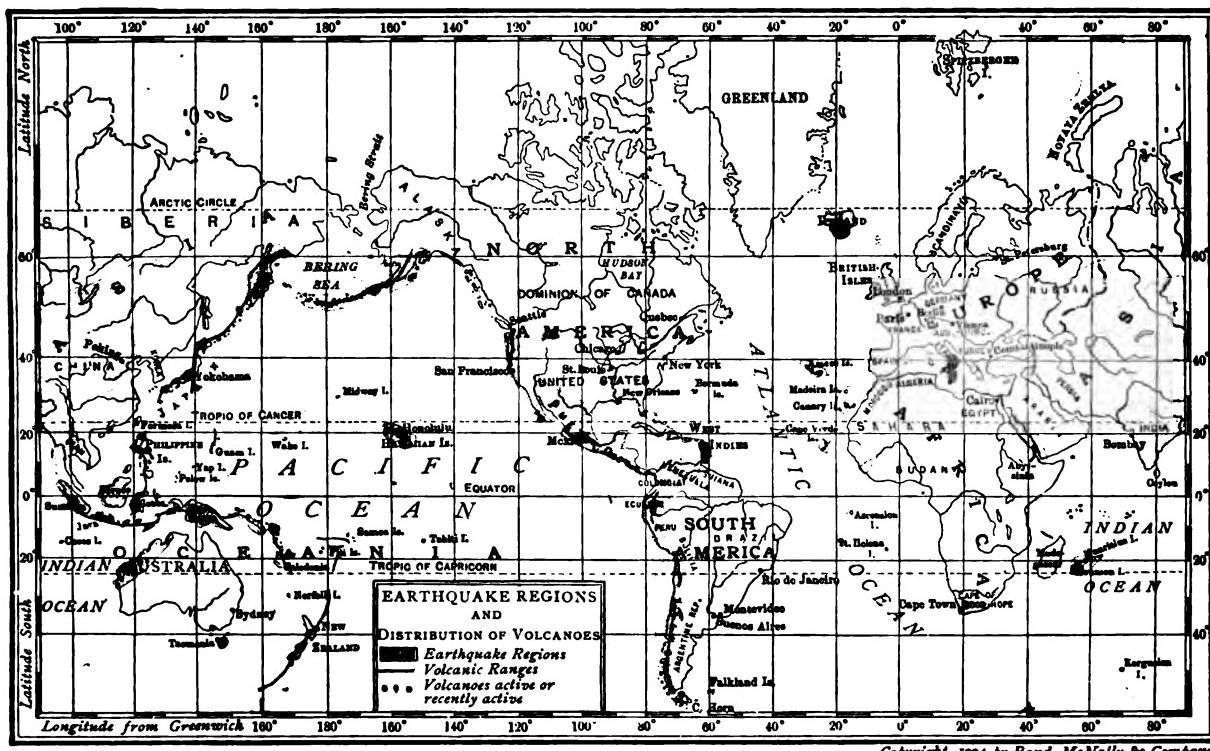


FIG. 69. Earthquake regions and distribution of volcanoes.

throat. Thus the lava plug may be left rising sharply above the rest of the country in the form of a peak. Such volcanoes, called *old* volcanoes because it has been a long time since they were in eruption, have lost their original shape and much of their mass. Old volcanoes exist in many parts of the world, and are numerous in western New Mexico. (See Figs. 67 and 70.)

Earthquakes. During volcanic eruptions, and oftentimes in mountain building, the rocks of the earth are cracked and perhaps ground against one another until the whole earth for miles around shakes from the blow, causing what we know as an *earthquake*. These are sometimes so severe that houses and bridges are shaken down. In countries sub-



FIG. 70. Devil's Tower, Wyoming. The last remnant of an old volcano

ject to frequent earthquakes the houses are usually built of wood, and with only one or two stories, so that they will not easily be overthrown by an earthquake shock. Buildings twenty or more stories high, such as are found in many American cities, would be severely shaken and much damaged by a severe earthquake.

Earthquakes sometimes occur beneath the sea and start a great wave of water, much as a wave may be formed by suddenly striking the bottom of a pan of milk or water. Such a wave may travel toward the shore, increasing in height as it goes, and advancing upon the land, may cause great damage and loss of life. In 1891 an earthquake wave struck the shore of Japan in the night and

swept away a large village, killing the people. The wave was not noticed out on the sea, for fishermen from that village knew nothing of it until they came ashore and found their village swept away. Sometimes earthquakes cause the land to crack open and make it rise or fall suddenly, but these effects are usually not so serious as those resulting from an earthquake wave.

Questions and Exercises

- (1) Name some of the evidences of the interior heat of the earth. (2) Locate some famous hot springs; geysers; volcanoes.
- (3) Locate the Yellowstone National Park and tell about its geysers and hot springs.
- (4) Draw a picture of Mount Vesuvius or some other active volcano, indicating the *crater* and the *throat*. (5) Of what is the *cone* of the volcano composed? How is it built up? (6) Bring to the class a good description of an ascent of Mount Vesuvius, or find out something about the recent eruption of Mont Pelée. (7) Locate Mount Etna; Stromboli; Mount Shasta; Fujiyama. (8) Draw a picture of one of these volcanic peaks and find out something of interest about it. (9) How does an eruption change the surface and aspect of a region?
- (10) Why may the Palisades of the Hudson be called a product of a volcanic eruption? (11) Why does the lava plug of an old volcano rise as a peak above the surrounding country?
- (12) What are some of the results of earth-



FIG. 71. Granite Needles, South Dakota. The strong rock has not worn away as rapidly as the weaker rock.

quakes? (13) Mention a part of the world where earthquakes have been frequent lately.

- (14) Find out about the last severe series of earthquakes in the United States.
- (15) Find out what part of our country has the most frequent earthquakes. (16) Why do severe earthquakes usually precede a volcanic eruption?
- (17) Name three volcanoes in North America. (18) Name the volcanoes in the islands of the sea.
- (19) In Europe.

XI. THE ATMOSPHERE

The Air About Us. Extending over us to an unknown height, and beneath in the spaces between the rocks of the earth, and even, to a certain extent, in the water of the oceans, rivers, and lakes, there is a mixture of invisible gases, commonly called *air*. The portion of the air which lies above the surface of the earth is known as the *atmosphere*.

The atmosphere may be hot or cold, wet or dry, light or heavy. From our daily experience we are familiar with its changes in temperature and with changes in the amount of moisture that it contains. Differences of temperature produce the most conspicuous differences between winter and summer. Differences in weight produce those movements of air over the



FIG. 72. Weathered peaks and slopes of loose detritus in South Dakota. Note how the strong rock layers protect the weak rock.

surface of the ground which we call *winds*. Differences in the amount of moisture contained in the air determine whether the weather is *fair*, *cloudy*, or *stormy*.

Weather and Climate. The conditions of temperature, moisture, and weight of the air existing at any one time, together with the winds, give us our *weather*, and the average weather conditions of any place make up its *climate*.

Soil Making by the Atmosphere. The atmosphere is necessary to us in many ways.

All animals breathe it, the land plants secure from it the greater part of their food, and it is the chief agent in changing solid rock into fine, productive soil. (See Fig. 73.) The moisture in the air helps to rust or decay the rocks, just as it *weathers* an unpainted house. Water freezing

in the rocks in winter, or very sudden changes in the temperature of rocks, cause them to break apart and become smaller. Anything that loosens the rock particles and helps the moisture in the air to penetrate into the earth, aids in the formation of soils. (See Fig. 72.) The loosened weaker portions of the rocks fall from their own weight and accumulate on the more gentle slopes. The strong portions of the rocks do not weather so rapidly and often stand up in fantastic columns or points. (See Figs. 71 and 72.)

In some parts of the world the rocks have been decayed to a depth of hundreds of feet.

(See Fig. 73.) This decayed material forms the detritus which slowly creeps down hill because of its weight, and is carried away by rivers and other agencies which we shall study later. The finer surface portion of this detritus is mixed with more or less decaying vegetable matter from the trees and grasses, and forms what we know as *soil*.

Temperature of the Air. We measure the temperature of the air by means of a *thermometer*, or heat measurer. Most thermometers consist of a glass tube containing

a small quantity of mercury. At the temperature of freezing the mercury stands at a certain point which, in the thermometer we generally use, known as a Fahrenheit thermometer, we call 32 degrees. At the temperature of boiling water the mercury stands at 212 degrees. The glass tube between

these limits is divided into 180 equal spaces, each of which is a degree, and we measure the temperature of the air at any time by noting the height of the mercury in degrees.

A temperature of 68 degrees is considered the most healthful temperature for our houses in winter. A temperature of between 90 and 100 degrees is that of a very hot summer day. Temperatures below 32 degrees are those of the colder part of winter, and a temperature of more than 32 degrees below the freezing point is said to be below zero. Such temperatures are very cold, but are



FIG. 73. *A deep soil accumulation in North Carolina.*
Note the absence of boulders or ledges.

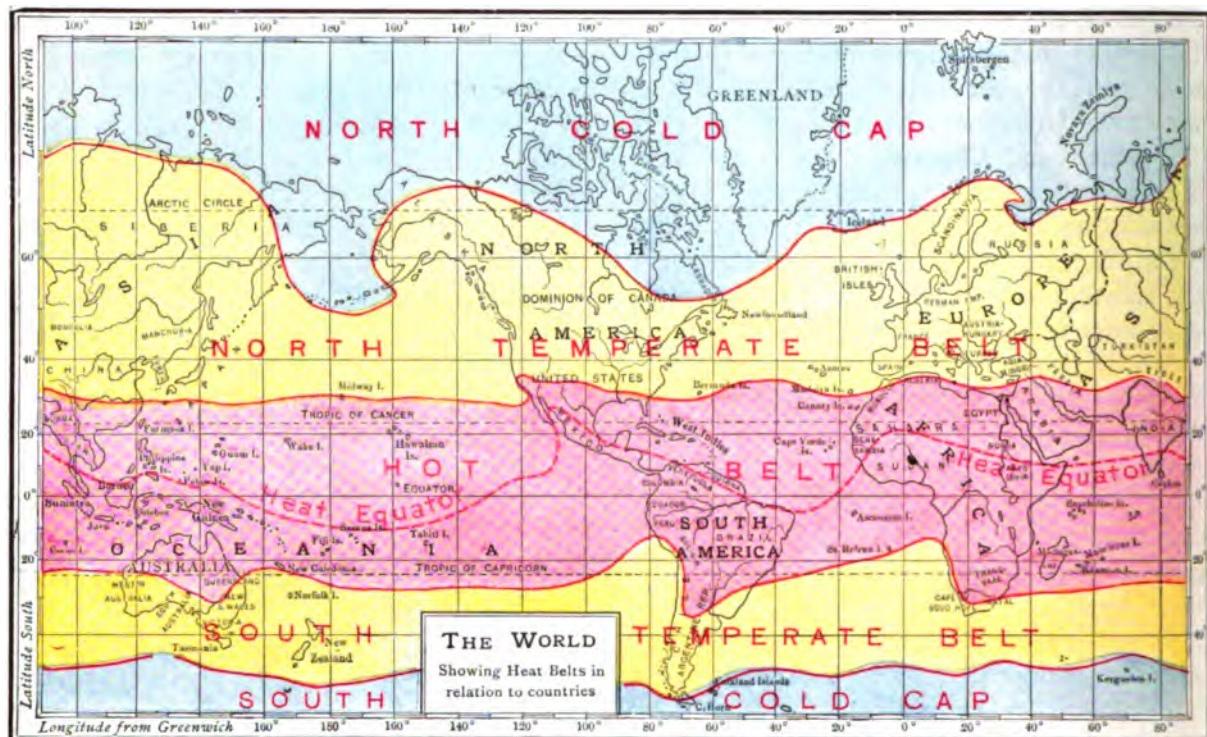


FIG. 74. A map of the world, showing the Heat Belts.

often experienced in a large part of our country during the coldest winter weather.

It is hotter in summer than at any other time. At that time the sun's rays strike the earth more nearly vertically, and are scattered over a smaller amount of surface. (See Fig. 75.) An area of a certain size gets more heat when the sun shines from high in the heavens and the shadows are shorter than when it shines obliquely.

The hottest part of the day is usually in the early afternoon and not exactly at noon, because the heat has been accumulating longer. For the same reason the hottest part of the summer in our country is in July and August instead of in June when the sun rises highest in the heavens.

The Temperature of Land and Water. If the land and water were heated with equal

ease, and if they retained their heat equally well, the earth could be divided into five bands, separated from each other by the parallels of latitude which bound the zones of sunlight. But the land is warmed more rapidly than the water and cools off more rapidly. The warmth received by the ocean is carried to different parts of the world, as the ocean waters are constantly in motion in a series of ocean currents, but that received by the land is concentrated. Chiefly because of these facts the boundaries between the several belts of temperature do not coincide with the

tropics and circles, although they run in a general east-west direction. (See Fig. 74.)

The Heat Belts. Extending about the world on both sides of the equator is the broad band known as the *Hot Belt*, in which the average temperature of the year is more than 68

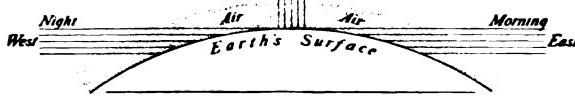
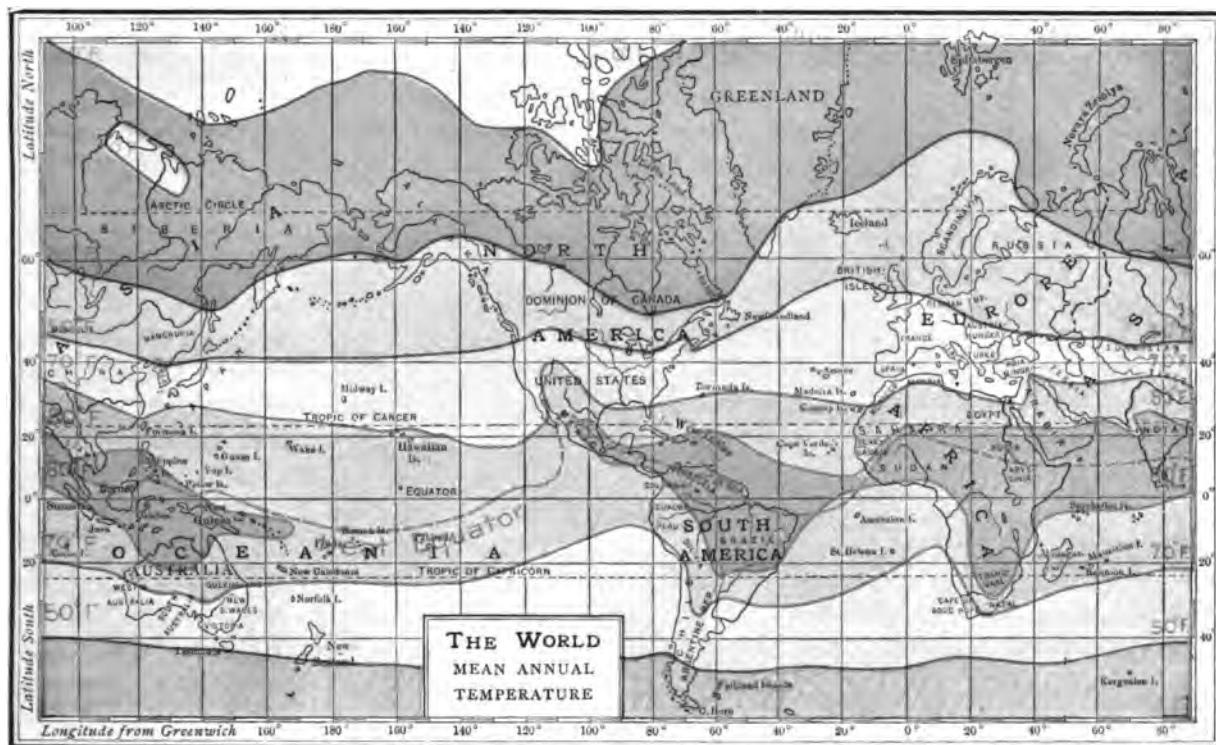


FIG. 75. Diagram of a ray of light striking the earth vertically and obliquely. Notice the difference in space covered.



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FIG. 76. A map of the world, showing the mean annual temperature.

degrees. This belt extends farther poleward and is broader over the land than over the ocean, because the land is more readily warmed than the ocean. It extends farther into the Northern Hemisphere than into the Southern, because there is more land in the Northern Hemisphere. (See Figs. 74 and 77.)

About the poles are two areas known as the *North* and the *South Cold Caps*, in which the average temperature of the warmest month of the year is never above 50 degrees. (See Fig. 74.) This is the average summer temperature required to ripen the

most hardy grains. The South Cold Cap extends much farther toward the equator than the North Cold Cap, because there is so much more land near the north pole than the south.

Between these limits are two areas known as the *North* and the *South Temperate Belts*. (See Fig. 74.) The North Temperate Belt contains far more land than the South Temperate Belt, is much broader, and includes the most

progressive countries of the world.

On each meridian there is some one place in the Hot Belt that has a higher average temperature than any point

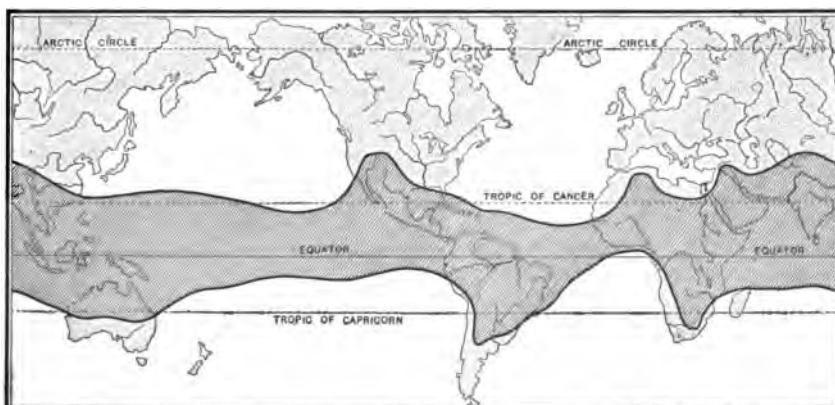


FIG. 77. Range of the Heat Equator.

north or south. The line connecting these places is known as the *Heat Equator*. (See Fig. 76.) In our summer, when the sun shines more nearly vertically in the Northern Hemisphere, the Heat Equator is, of course, much farther north than in our winter. Its average position is shown on the map. (See Fig. 74.) We shall find that this Heat Equator is of great importance in helping to explain the various wind systems of the world.



FIG. 78. A sand dune in New Mexico. It is slowly burying trees and shrubs.

Questions and Exercises

(1) What is the temperature of your school-room at this moment? What is the lowest temperature you have ever experienced? The highest? Describe the effects of cold and heat on you and on your surroundings.

(2) Keep a record of the outdoor temperature for one month, taking three readings daily. Find the average temperature for the month. Note the day in which there was the greatest range of temperature. (3) Keep a daily record of temperature for the month of January, and find the average for the month. Compare your results with the January isotherm for your region.

(4) Study the extent of the Hot Belt in the Eastern and Western Hemispheres. In which Hemisphere is it the wider? Why does it reach farther north in Eurasia than in North America? (5) Make a list of the countries of North and South America which are in the Hot Belt in July; in January. Underline those countries which are always in the Hot Belt. (6) Make a list of the countries of the world which are crossed by the Heat Equator in July. (7) Make a list of the progressive nations of the world in the North Temperate Belt.

(8) Break open a weathered pebble and compare the appearance of the inside with the outside. Explain what you see. Explain why it is often hard to decipher the inscriptions on ancient stone monuments.

(9) How do earthworms help in soil making? Find out why a farmer often plows his land in the autumn.

XII. THE GREAT WIND SYSTEMS OF THE WORLD

Winds and Calms. Air moving horizontally is called a wind. When you hold up your moistened finger and do not feel it colder on one side than on the other there is no wind. The air is then either quiet, or rising or falling, and we have what we call a calm. Winds are produced by differences in the weight of the air in different places. It is the force of the moving

air that turns mills, speeds sailing vessels, and bends trees in a storm. It is the wind also that carries along the sand on a beach or desert and piles it in great hills known as sand dunes. (See Fig. 78.)

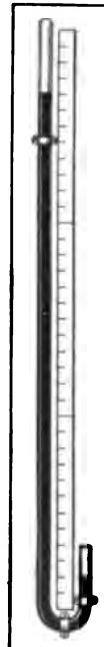


FIG. 79. A simple barometer.

The Barometer and Its Use. The weight of the air is determined by an instrument known as a weight measurer, or barometer. The best barometers are made of a U-shaped tube of glass with one side of the "U" nearly a yard long and closed at the upper end. The other side is only a few inches long and is open at the end so that the air can readily reach the liquid. (See Fig. 79.) The tube is filled with mercury and then placed in a vertical position. The mercury will fall from the top of the long arm until at the seashore over a large part of the world there is a difference of thirty inches in the height of the mercury in the two arms of the U-shaped tube. As the air is the only thing pressing upon the liquid, it is clear that this is what holds up the mercury in the long column. If the weight of air decreases, it does not press so hard on the mercury in the short arm of the tube and therefore the mercury falls in

the long arm. By measuring the height of the column of mercury held up by the air which presses down on the mouth of the tube, we can ascertain the weight of the air.

As one ascends, the air is lighter and the mercury in the barometer consequently falls.

If the pressure at sea level is thirty inches, it will be twenty-nine inches at a height of 910 feet, twenty-eight inches at 1,850 feet, twenty-seven inches at 2,820 feet, and twenty inches at 10,550 feet,

which last height is about that of the city of Leadville, Colorado. It is by noting the pressure of the air at different heights, and by comparing this pressure with that at the seashore at the same time, that we can most readily measure the height or *altitude* of elevations above the level of the sea.

The Trade Winds. By observing that in a room the warm air rises to the ceiling, while the colder air is near the floor, we learn that cold air is heavier than warm air. The coldest parts of the world generally have heavier air than the warmest. (See Figs. 80 and 83.) Over those portions of the earth just north and south of the Heat Equator the cooler, heavier air is continually moving toward the lighter belt near the Heat Equator, forming the great system of

winds known as the *Trade Winds*. (See Fig. 81.) These trade winds are the most constant winds of the world, and are so named

because they blow regularly along a definite path.

As the air approaches the Heat Equator it rapidly becomes warmer and is therefore better able to absorb moisture. Hence the trade-wind area, especially over the oceans,

is a great *fair weather* belt. The sky and sea are beautifully blue, few clouds are seen, and the brisk moving air is invigorating. Where the trade winds blow over the land far from any ocean, they

can take up more water than the land will furnish. Thus such regions are deserts with very little rainfall and almost continually clear blue sky. The best illustration of a trade-wind desert is the Sahara in northern Africa.

We should expect the trade winds to blow due north or south, but as the earth is continually rotating from west to east the winds are deflected from a straight north-south course. All winds moving over the surface of the world are turned to the right of their course in the Northern Hemisphere and to the left in the Southern Hemisphere. Therefore the trade winds blow from the northeast in the Northern Hemisphere and from the southeast in the Southern Hemisphere.

Doldrums. At the Heat Equator the warm, light air rises, and at a great height flows off toward the polar regions of the world.

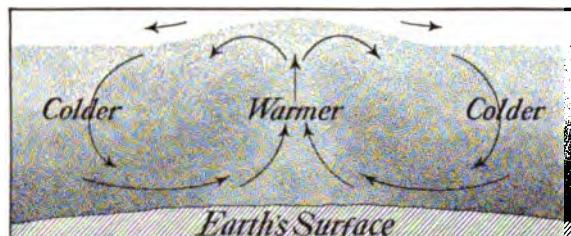


FIG. 80. Over the cool regions of the earth the air descends and moves toward the warmer regions, where it rises.

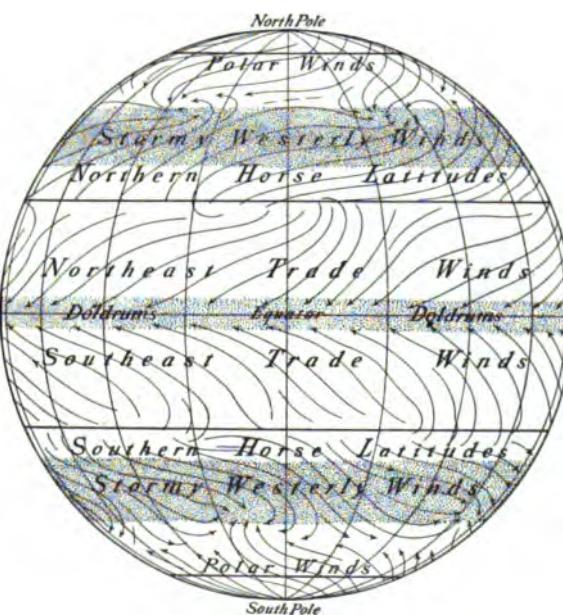


FIG. 81. The wind systems of the world.

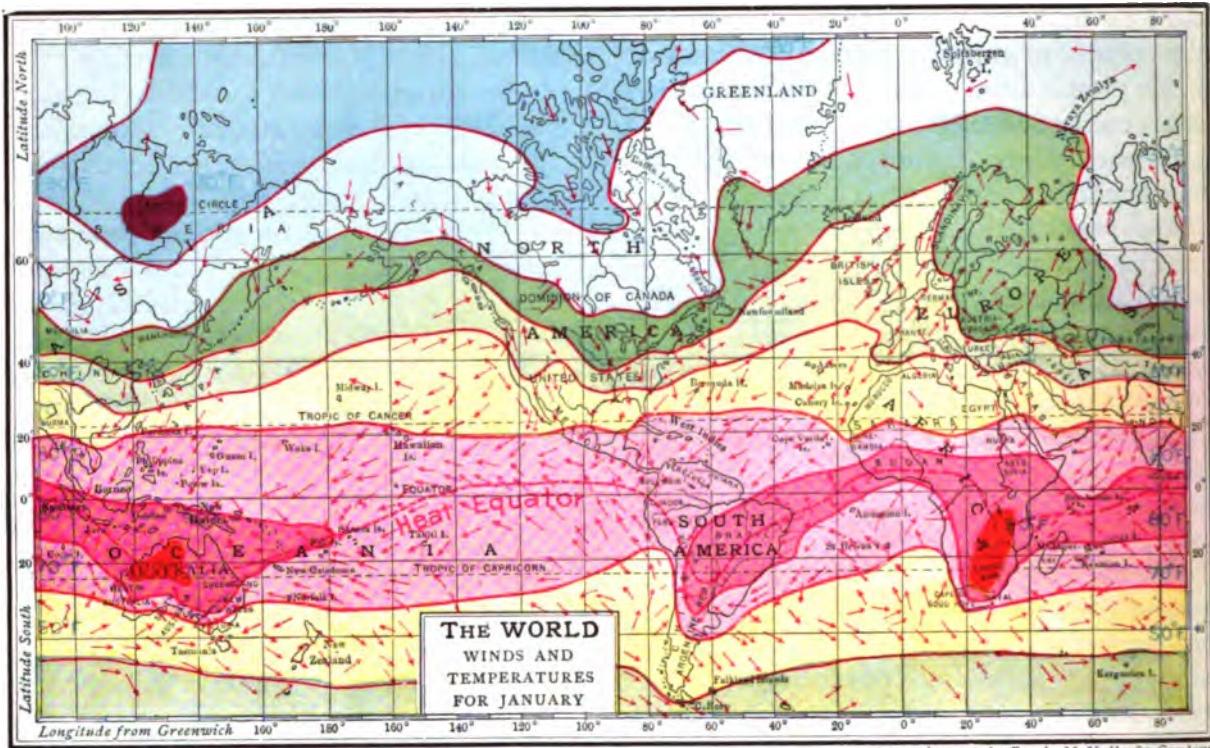


FIG. 82. Winds and temperatures of the world for January

Immediately bordering the Heat Equator, therefore, is a region where the air is slowly ascending, and where at the surface we have an area of calms known as the *Doldrums*.

(See Fig. 81.) Years ago, when the larger part of our commerce was carried on by sailing vessels, the doldrum belt was the source of much annoyance to sailors, because they might have to wait for weeks for enough wind to carry them across into the trade-wind area on the other side. The doldrum belt is strikingly contrasted with the trade-wind region because it is an area of excessive rainfall and

little fair weather. The air in the doldrums is always warm, moist, and depressing, much like a very uncomfortable summer day in the eastern United States.

Monsoons. As the Heat Equator during a large part of the year is in the Northern Hemisphere, the southern trade winds must then blow across the equator into the Northern Hemisphere to reach the doldrum belt. These southeast winds are turned to the right when they cross the equator into the Northern Hemisphere and become *southwest* winds. In the same way winds that have to blow into

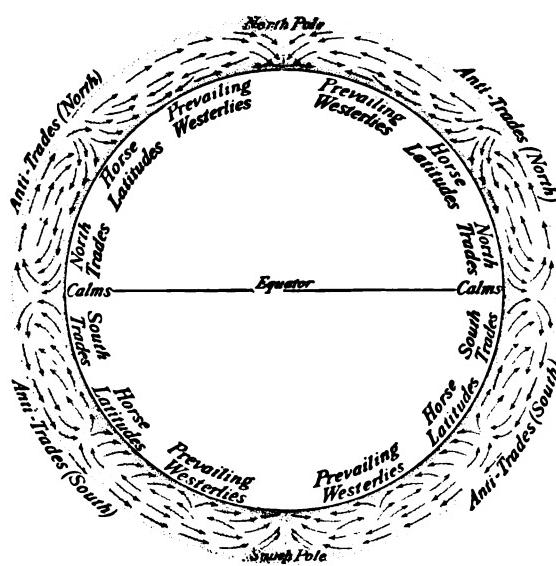
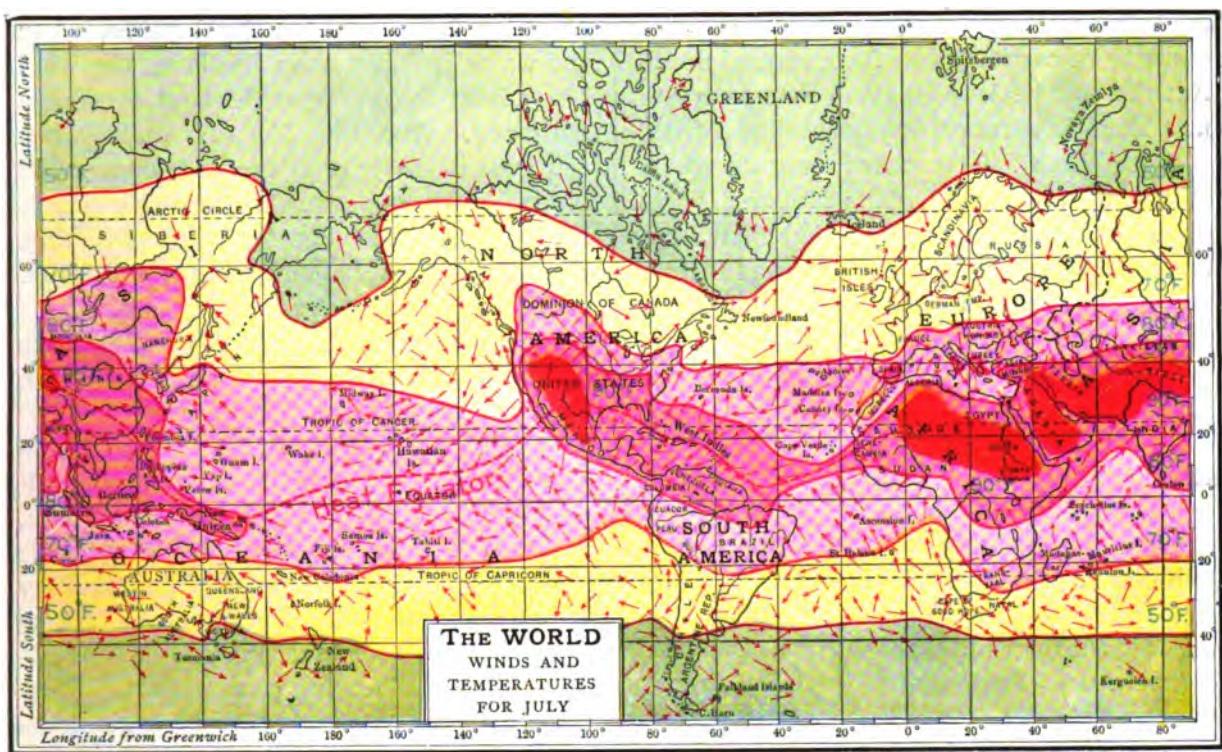


FIG. 83. Diagram of the earth showing the general movements of the atmosphere.



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FIG. 84. Winds and temperatures of the world for July.

the Southern Hemisphere, when the Heat Equator is in this hemisphere, are turned from a northeast direction into a northwest direction when they cross the equator. There are, therefore, certain areas in the world which receive their winter winds from one direction and their summer winds from the opposite direction. These winds which change with the season are known as *Monsoons*. The best developed monsoon winds are found in India and along the southeastern coast of Asia.

Horse Latitudes and Westerlies. At about one-third the distance from the equator to each pole there is a belt where the weight of the air is on an average somewhat greater than at the equator. Over these belts the air is descending to take the place of the surface air flowing toward the equator and toward the poles. The result at the surface is a series of calms known as the *Horse Latitudes*. (See Fig. 83.)

These horse latitudes are boundaries, not

only of the trade winds, but of the great series of winds known as the *Stormy*, or *Pervailing Westerly Winds*. (See Fig. 83.) The westerly winds circle round and round the world, blowing from the west-southwest in our hemisphere, and from the west-northwest in the Southern Hemisphere. They exist throughout the larger part of the temperate belts, and so blow over the regions occupied by the chief nations of the world. These winds are interrupted by frequent storms, during which the wind may blow from almost any direction. The prevailing direction, however, is from some point in the west.

In the Southern Hemisphere these winds are strong and constant, as the air moves mostly over the ocean, and is not turned from its course by the land. Here they are known as the *Brave West Winds*, because of their strength, or the *Roaring Forties*, from the latitudes in which they are best developed. Sailing vessels between England and Australia

are borne eastward by these winds and find it easier to be carried on by them around South America and back to England than to try to face them in a return voyage around Africa.

Polar Winds. The other important winds of the world are the *Polar Winds*. These originate in the polar regions and blow from the northeast in our hemisphere and from the southeast in the Southern Hemisphere. Little is known concerning them.

Summer and Winter Winds. The areas of the world over which the great wind systems blow are not the same in the summer as in the winter, because the weight of the air is differently distributed in the two seasons, owing to the differences in the distribution of temperature. (See Figs. 82, 84, and 85.) These winds are much more constant over the ocean than over the land, because the lands are so much colder at one season and warmer at the other than the adjoining ocean, and also because the lands are crossed by mountain ranges and high plateaus which turn the winds from their course.

In the region of the stormy westerly winds the continents are much colder in winter than the oceans, especially in the Northern Hemisphere, and warmer than the oceans in summer. Therefore, along the eastern coast of the United States, for instance, the cold winds blow from the continent in the winter and toward the continent in the summer, always blowing from the area of colder, heavier air to that of warmer, lighter air.

Sea Breezes and Mountain Winds. At certain seasons of the year in regions bordering a large body of water the winds may

change twice a day. In the daytime, when the water is cooler than the land, the wind blows from the water to the land, forming a *sea breeze*. (See Fig. 86.) At night, when the land is colder than the water, the wind blows in the opposite direction, forming a *land breeze*. (See Fig. 87.) At the time when the wind is changing from one direction to another there is, of course, a calm.

In those parts of the world where there are high plateaus or mountains, the wind, as a rule, changes its direction twice daily.

At night the wind blows down the mountain valleys into the lower land, beginning first as a gentle breeze, and gradually developing into a strong wind, known as a *mountain wind*. In the daytime the warmer air of the valleys moves up the mountain slopes in the opposite direction, forming a *valley wind*. This change of direction is so constant in the summer in some of our western mountains that a hunter sleeping near a camp fire will often go to sleep up the valley from the fire to

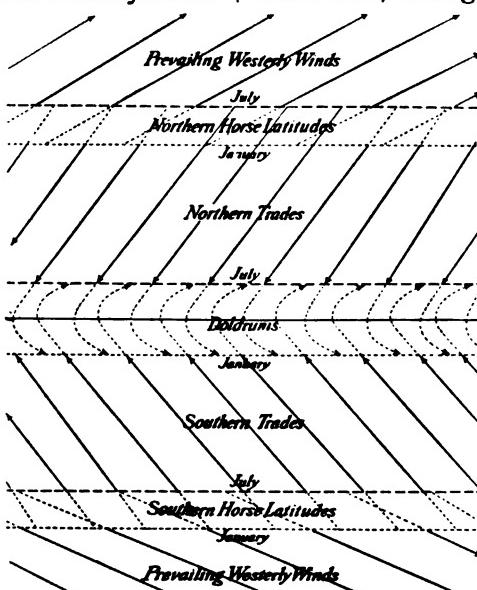


FIG. 85. Diagram showing how the wind systems of the earth move north and south between summer and winter.

escape the smoke, so certain is he that before morning the wind will blow from that direction.

Questions and Exercises

- (1) Open the window in your schoolroom, or in some room at home, six inches at the top and six inches at the bottom. Hold strips of thin paper at the top and bottom and notice which way the paper moves. Make a drawing showing the movement of the air in the room. How is a similar movement illustrated by a fire in a grate? Draw arrows showing the indraught of cooler air and the upward movement of heated air. Show by a drawing how the movement of air in a fireplace is like that in the doldrum belt.

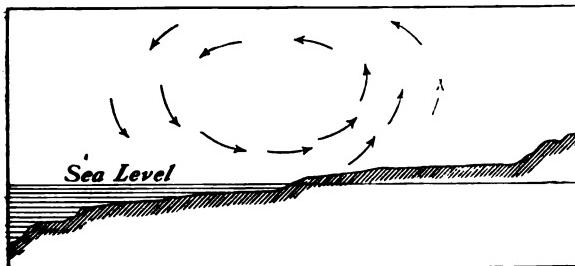


FIG. 86. Diagram of a sea breeze.

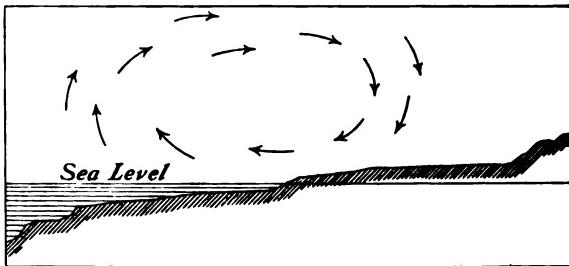


FIG. 87. Diagram of a land breeze.

(2) On an outline map of our continent draw arrows showing the direction of the trade winds. On this map write the names of the countries blown over by the trade winds. Locate two cities in this belt. (3) On the map used in Exercise 2 draw arrows to show the direction of the stormy westerlies. Write the names of the countries in this wind belt. Locate two cities on the western and two on the eastern coast of our continent. (4) On an outline map of the world draw arrows showing the direction of the trade winds; the westerlies. Indicate the doldrums and the horse latitudes.

(5) Explain how a barometer measures the weight of the air. Relate something from your own experience that shows that air has weight. (6) Along with your temperature record keep a daily record of the air pressure and of the direction of the wind. Find out the prevailing direction of the wind for a month. (7) Explain why certain winds in the Southern Hemisphere are called the "roaring forties." Who was the first European mariner to drive his ship westward in the face of these winds? (8) In which hemisphere do the northeast trade winds blow over the greatest extent of land? The westerlies? (9) Make a list of the desert regions over which the trade winds blow.

(10) Which winds bring rainy weather to your home? Clear weather? Give the reason in each case. (11) Write a composition on what you have noticed about sea breezes. Tell what time of day the breeze sprang up, its effect on the water, and on you; when it died down; its effect on sailboats; any experience you may have had which was connected with such a breeze.

(12) If you live inland, why does not the barometer ordinarily stand at thirty inches?

XIII. RAINFALL AND ITS DISTRIBUTION; STORMS

Moisture in the Air; Deserts. Everywhere in the world the air contains some moisture. Warm air can hold more moisture than cold air, and warm air if chilled will lose a certain amount of its moisture. Thus, we often see moisture condense in drops on the cold window pane of the laundry or the railroad car.

Days in which the amount of moisture in the air is small in proportion to what it might hold at that same temperature are dry days. On such days drumheads are tight, postage stamps do not stick together, and hair will crackle as it is combed. When the air is full of moisture, even though we cannot see it in drops, the days are damp. On such days one perspires freely and feels uncomfortable.

In certain parts of the world it is always dry, and there is so little moisture in the air that it rarely rains. Such regions we know as *deserts*. (See Fig. 97.)

In other parts of the world the air is always moist, and whenever it is cooled some of the moisture condenses as fog, or dew, or rain.

The Causes of Rainfall. All of the moisture that comes to the surface of the earth in the shape of fog, dew, snow, or rain is called its *rainfall*, and



FIG. 88. A flat-roofed house in New Mexico. Owing to the small rainfall, peaked roofs are unnecessary.

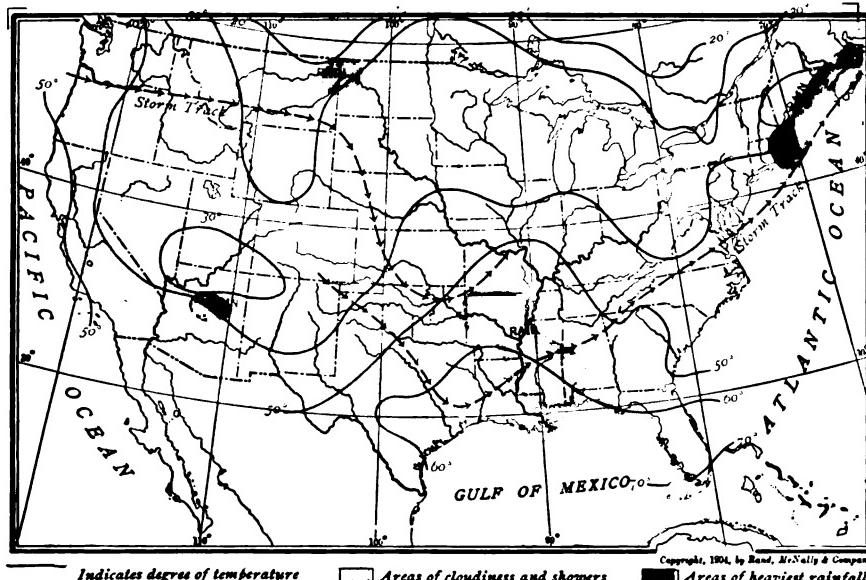


FIG. 89. Temperature, cloudiness, and rainfall, February 27, 1902.

anything that will cool the air so as to cause it to deposit its moisture will produce rainfall.

In the doldrum belt the warm, moisture-laden air brought by the trade winds is continually rising and cooling; hence in much of this region it rains daily. (See Fig. 97.) As the doldrum belt moves north and south, the regions over which it passes have a rainy season and then a dry season.

Whenever winds are obliged to move over mountains the air is cooled and rainfall usually follows. Trade winds thus produce rainfall on the coast of Brazil and eastern Australia, and the prevailing westerlies produce rainfall on the northwestern coast of America, in the northern British Isles, and in Norway. (See Fig. 97.)

Descending air grows warmer constantly, gaining one degree of tem-

perature for about every 300 feet of decrease in height. As it gains in temperature it becomes better able to absorb moisture. The air descending over the land cannot usually secure all the moisture it can hold, and is therefore dry. Thus the leeward side of mountain ranges is usually drier than the windward side, as in Australia and the western United States. (See Fig. 97.)

Storms or Cyclones.

Almost the whole of the United States, like other regions lying in the path of the prevailing westerly winds, has frequent storms. These storms are regions of light air, toward which the heavier air flows from all sides. Toward the center of a storm the barometer falls, because of the decreased weight of the air. Therefore, a storm center is known as a *low*. Such storms or *cyclones* move from west to east across

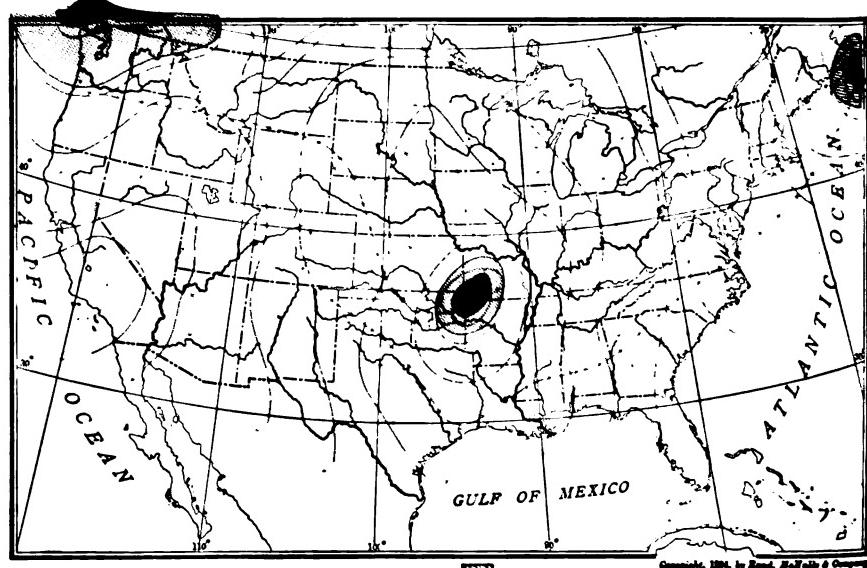


FIG. 90. Atmospheric pressure and winds, February 27, 1902.

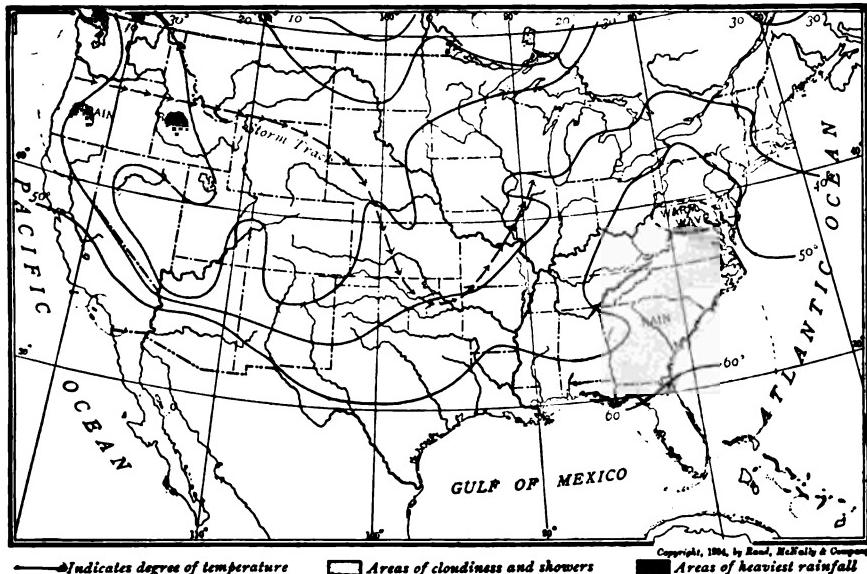


FIG. 91. Temperature, cloudiness, and rainfall, February 28, 1902.

the country, whirling as they go and often drawing the air in toward them for many hundreds of miles. (See Figs. 90, 92, and 96.)

Whenever a storm occurs, the air rushing in from all sides is drawn upward to high altitudes, circling around the center of the storm as water circles about the opening in the bottom of a basin as it flows out. If the air is drawn from over the ocean, it takes in a large amount of moisture which falls as rain when the air rises near the center of the storm. Thus those regions which have frequent storms, as do the areas of the prevailing westerly winds, have also frequent rains. In studying the distribution of rainfall over the world (see Figs. 89, 91, and 93) it should be remembered that snow is considered as rainfall, and that it is measured as rain because we know how much

water will be formed by the melting of a given mass of snow. The rainiest region of the world is in India, where the warm, moist air of the southwest monsoon, as it rises, is cooled on the sides of the mountains. The rainfall here is often as much in a day as the northeastern United States gets in a year.

Storm Winds. In the beginning of a storm in the eastern United States the wind usually blows from the north-

east or southeast, increasing in intensity as the storm center comes nearer to us. As the storm center passes and the clouds break away, the wind changes into some quarter of the west.

In winter the fair-weather winds are usually from the northwest. They are very cold and dry and may cause such sudden changes of temperature that we have a *cold*

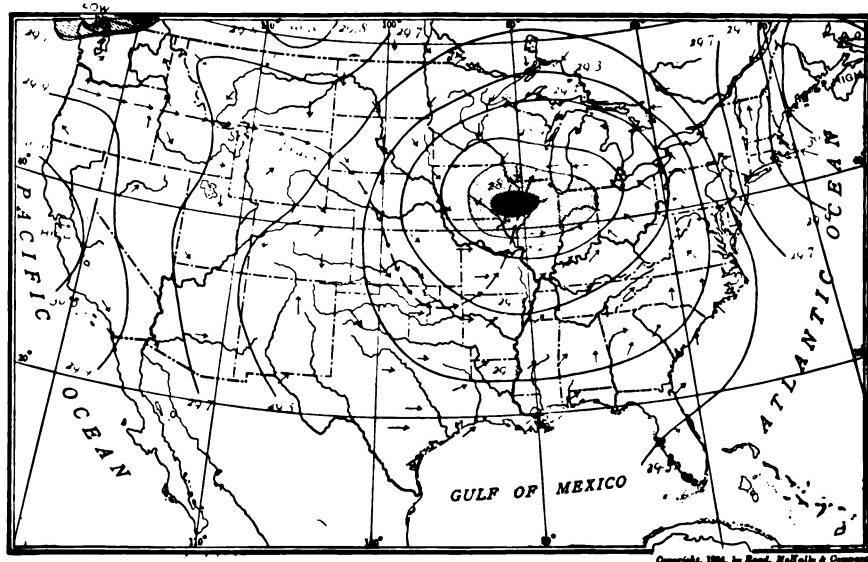


FIG. 92. Atmospheric pressure and winds, February 28, 1902.

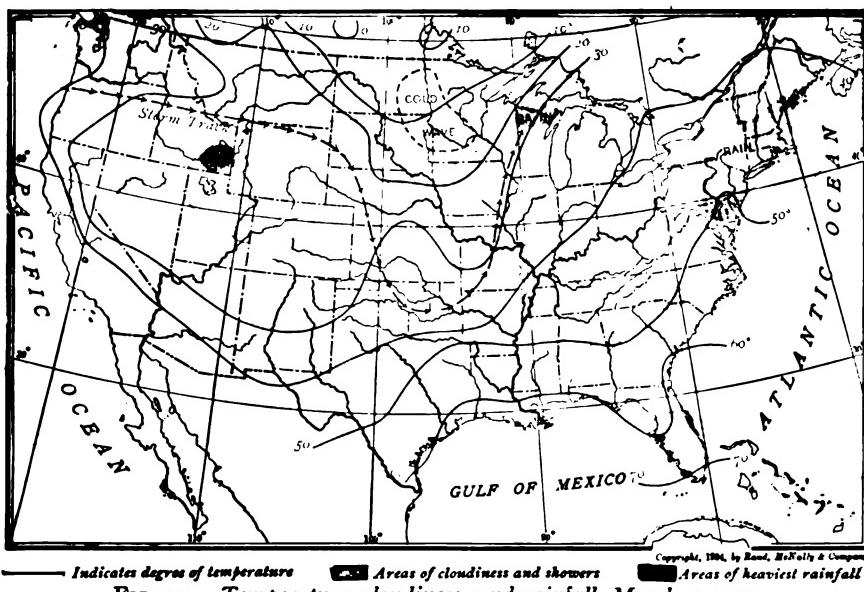


FIG. 93. Temperature, cloudiness, and rainfall, March 1, 1902.

wave. (See Fig. 94.) Such a northwest wind may blow for several days, the cold increasing and the barometer constantly rising. There may finally come a period of fair, calm weather. This shows that we are in an area of high pressure which follows the low pressure of the storm. (See Fig. 95.) It is then we have our coldest winter weather.

The oncoming of a storm, therefore, is usually marked by the falling of the barometer, due to the lightness and moisture of the air, and the oncoming of fair weather by the rising of the barometer, due to the dryness and heaviness of the air. The weight of the air changes much more rapidly in the

not only along our coast, but also along the southeastern coast of Asia, where they are called *typhoons*. These storms are known as *tropical cyclones*, to contrast them with the cyclones which originate in the belts of westerly winds. Except for the rains of the rainy season, these are the only storms in the trade-wind belt.

Tornadoes. In the central and eastern part of our country in the spring months we sometimes have local but very intense storms known as *tornadoes*. These usually occur on warm days when the surface air is very hot and full of moisture and when the overlying air is heavy and cold. Finally the warm

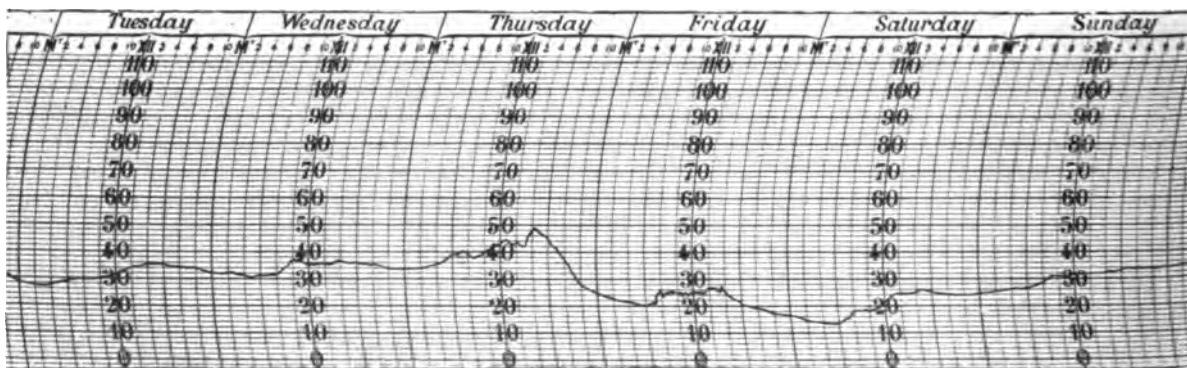


FIG. 94. Chart to show changes in temperature during the passage of a cyclone followed by a cold wave.

winter than in the summer, and so we have our strongest winds in the winter, and with few exceptions, our severest storms.

Tropical Storms. In the autumn months we sometimes have, along the eastern and southern coasts of the United States, very severe storms, much like our winter storms, except that they have developed in the tropics and moved north into our latitude. They occur

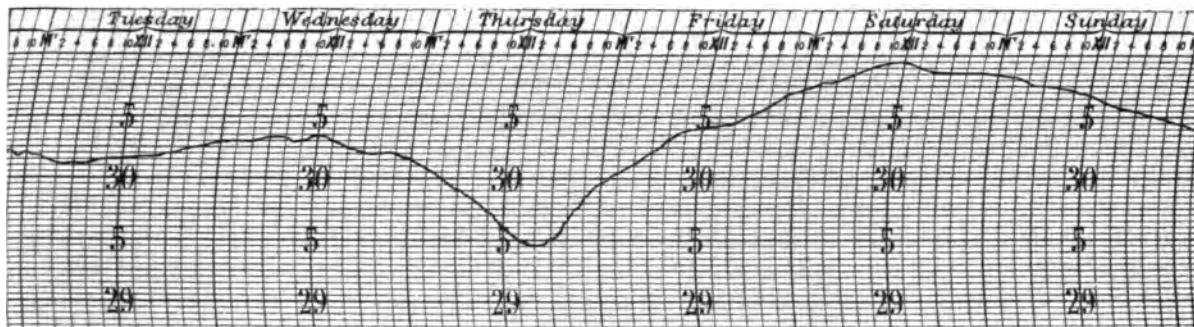


FIG. 95. Chart to show changes in atmospheric pressure during the passage of a cyclone followed by a cold wave.

air rises, the cold air falls, and a terrific whirling wind is developed, followed by heavy rainfall. A tornado often causes an enormous amount of damage.

Questions and Exercises

(1) Tell where you have seen moisture condensing. (2) Where was the moisture before it was condensed into drops? (3) What caused it to condense? (4) Make a list of all the forms of moisture that you are familiar with. Which form is the most common where you live? (5) Which wind most frequently brings this moisture?

(6) Explain why the trade-wind belt contains many deserts. (7) Make a list of the countries in some one continent which lie in the westerlies and which have a heavy rainfall. Opposite each country write one cause of such rainfall. Do the same for the trade winds. (8) Make a list of the countries in the westerlies which have a light rainfall.

(9) Why should there be daily rains in the doldrums? (10) At what time of day do these rains occur? (11) On an outline map of the world, color the doldrum belt for January; with a dotted line show its position for July. (12) Locate a town which is in this belt in January; in July. (13) Find out if you can the yearly rainfall of these towns and compare with your own.

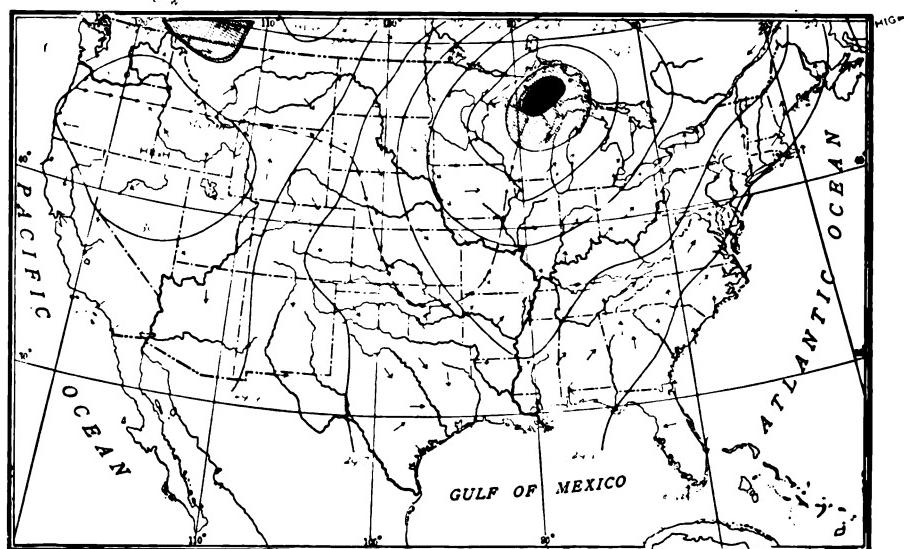
(14) Draw a diagram showing the difference in rainfall between the windward and leeward sides of a mountain range. (15) What mountain range in the westerly-wind belt

might your diagram illustrate? In the trade-wind belt? (16) What difference in vegetation does this difference in rainfall produce? In industries? In the density of population?

(17) From which direction does the wind generally blow at your home when a storm begins? (18) From which direction does the wind come when the storm begins to clear? (19) From which direction does a storm generally come to you? (20) Toward what section of the country does it generally pass from you? (21) When a storm center is just west of the central Mississippi Valley, what would be the probable direction of the wind at Memphis? At Cincinnati? At Pittsburgh? At Atlanta? (22) What portion of the country would have rain? Clear weather?

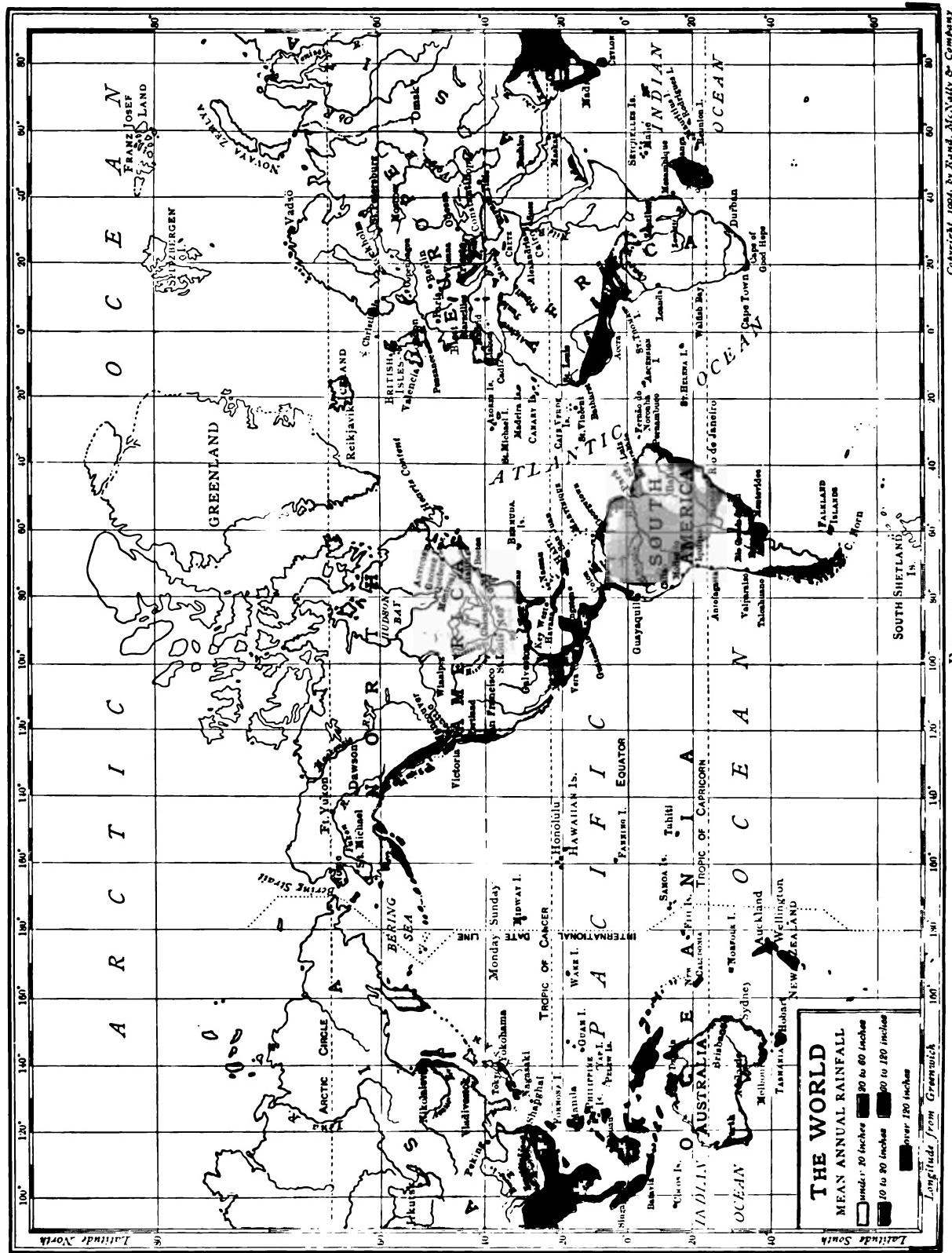
(23) Compare the rainfall of Winnipeg and New Orleans and account for the difference.

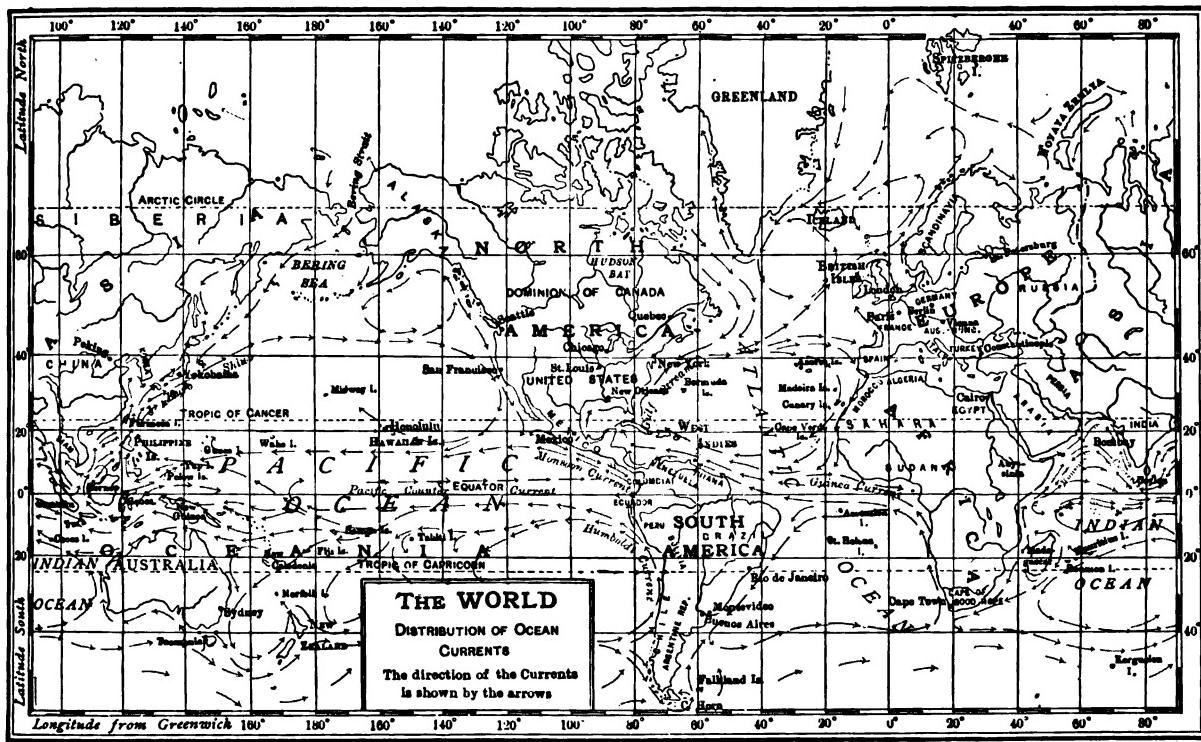
(24) How does the difference in the amount of rainfall in eastern and western Nebraska affect its industries? Its population?



Indicates direction of winds — Indicates equal pressure ■ Areas of low pressure ■ Centers of low pressure
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FIG. 96. Atmospheric pressure and winds, March 1, 1902.





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FIG. 98. A map of the world showing the ocean currents.

XIV. THE OCEANS

The Ocean Currents. The water of each ocean is continually circling about in the ocean basin, giving us a system of *ocean currents* or *eddies*. Bordering the equator, where the trade winds blow from the northeast or southeast, the waters of the ocean are blown toward the west until they are deflected by the continents. (See Fig. 98.) Turning then toward the poles, and being deflected, like the winds, to the right in the Northern Hemisphere and to the left in the Southern Hemisphere, they flow away from the equator until they move into the region of the westerly winds. They are then blown along to the eastward until they again strike the continents, when they turn again toward the equator. The currents in the northern oceans move from the east to the west along the equator, then to the north and again to the south, swinging round in the same direc-

tion as the hands of a watch. The direction of the southern currents is, of course, opposite to the direction of the hands of a watch.

The Great Eddies. These systems of currents are named from the ocean in which they occur, as the *North Atlantic Eddy*, the *South Atlantic Eddy*, the *North Pacific Eddy*, the *South Pacific Eddy*, and the *North and South Indian Eddies*. (See Fig. 98.) Around the south pole is the great eddy of the Antarctic Ocean, which is moving constantly eastward, in the same direction as the southern part of the eddies of the several oceans. In the center of each of the great eddies there is an area of quiet water with but little motion. The direction of the ocean currents is so much like that of the prevailing winds in the different regions that it is believed that the winds are the chief cause of the ocean currents.

Currents of the Indian Ocean. The best proof that the wind produces the ocean

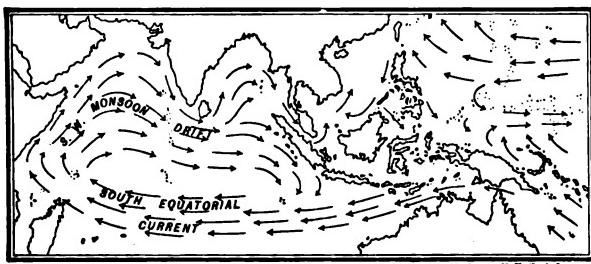


FIG. 99. *The direction of the currents in the Indian Ocean in summer.*

currents is the fact that in the northern Indian Ocean the currents change their direction in accordance with the direction of the monsoon winds. In the summer, when the southwest monsoon blows over this region, the currents move from west to east in the northern part of the ocean, and from east to west in the southern part. In the winter, when the northeast monsoon blows, the currents change their direction and move from east to west in the northern part of the ocean, and from west to east in the southern part. (See Figs. 99 and 101.)

Warm and Cold Currents. Certain portions of the system of ocean currents are particularly well known and have been definitely named. For instance, in the North Atlantic there is a stream of water issuing from the Gulf of Mexico known as the *Gulf Stream*. (See Fig. 98.) This stream of clear warm water unites with the western portion of the North Atlantic Eddy, called the *North Atlantic Drift*, because of the slow motion it has, and is not distinguished as a separate current north of Cape Hatteras. A similar current, known as the *Japan Current*, or *Kuro Shiwo*, extends from Japan part way across the Pacific Ocean. (See Fig. 98.) A cold current, known

as the *Labrador Current*, creeps down along the eastern coast of North America until it finally settles beneath the waters of the North Atlantic Drift off the coast of New England.

Importance of Ocean Currents. The system of ocean currents keeps the waters of the ocean constantly in motion, so that no part of it gets unduly warm. As the westerly winds move across the warm ocean in winter they are tempered by the warm water, and reach

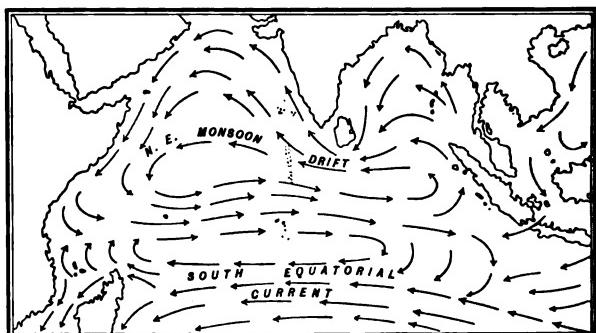


FIG. 101. *The direction of the currents in the Indian Ocean in winter.*

the continents to the east very much warmer than they were when they started across the ocean from the continents to the west. It is for this reason that the northwestern coasts of North America and Eurasia are so much warmer in winter than the northeastern coasts at the same distance from the equator.

The ocean currents are also important because they aid vessels going in the direction of their flow, and impede vessels going in the opposite direction. Columbus in his voyage to America had to sail against both the currents and the winds until he finally came into the trade winds which blew him along to the island of San Salvador. In a recent voyage across the Atlantic, in



FIG. 100. *Waves breaking on a boulder-strewn Californian shore.*

a small boat, a bottle was thrown overboard. After floating for two years, it was cast ashore on the island of San Salvador almost at the foot of the monument which was built there to commemorate the discovery of the island by Columbus.



FIG. 102. A beach of sand and pebbles. Notice the wall built to protect the cliff from the action of the waves.

Questions and Exercises

(1) Fill out the following chart, using the globe in getting your answers:

The Atlantic Ocean is bounded { (a) on the north by
 (b) on the south by
 (c) on the east by
 (d) on the west by

The Pacific Ocean is bounded { (a) on the north by
 (b) on the south by
 (c) on the east by
 (d) on the west by

The Arctic Ocean is enclosed { (a) by

(2) On an outline map of the world show by

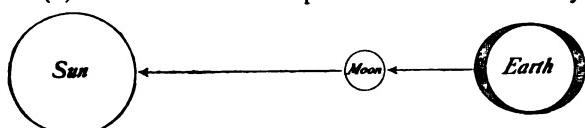


FIG. 103. Diagram showing the formation of tides at time of new moon.

arrows the eddies in the Atlantic, South Atlantic, North Pacific, and Indian oceans. part of the North Atlantic Eddy carries warm water northward? Which part of the South Atlantic Eddy carries warm water southward? Which part of the South Atlantic Eddy carries cool water northward? Which part of the South Pacific Eddy carries cool water northward? (4) On the outline map used in Exercise 2, write the words "warm" and "cool" over the corresponding parts of the eddies.

(5) Why are the waters on the coast of Maine colder than those along Marthas Vineyard? Why do fogs prevail where the Labrador Current and North Atlantic Drift meet?

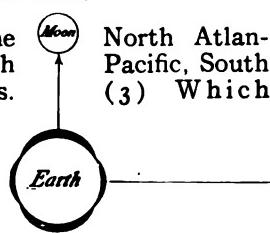


FIG. 104. Diagram showing formation of tides at a time halfway between new and full moon.

by the power of gravitation, draw the water upward until it is highest on the meridian

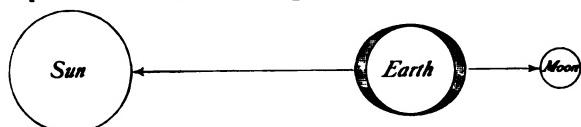


FIG. 105. Diagram showing formation of tides at full moon.

XV. WAVES AND TIDES

The Formation of Waves. The water of the ocean is not only in motion through this system of ocean currents, but it also has two other motions, known as *waves* and *tides*. Waves are

formed in any body of standing water, and even on broad, flowing rivers, whenever the wind blows. The wind blowing over the surface of the water causes it to rise and fall, forming crests and troughs which are known as *waves*. (See Fig. 100.)

The water itself moves forward very little, but the wave form travels through the water great distances. As the wave approaches the shore where the water is shallow, there is not enough water to form the broad, low wave of the deep sea, and the wave increases in height and decreases in breadth until finally the top portion falls with a blow on the shore, making breakers or *surf*. (See Fig. 100.)

Tides. Tides are periodic movements of the water that occur over the ocean, in estuaries, and in some lakes. The whole surface of the water rises and falls twice each day in most places, with an interval of twelve hours and

twenty-five minutes between high tides. The tides are really great waves, caused by the fact that the sun and the moon,

draw the water upward until it is highest on the meridian

nearly under the moon, while another tidal wave is formed at the same time on the opposite side of the earth. (See Fig. 103.) The explanation of this opposite tide is too difficult to be given in this book. As the earth turns to the east and the moon is over a meridian farther and farther to the west, the tide follows as far as it can, first rising on the shore and then receding to form the next tide wave. When the water is rising we call it *flood tide*; when it is flowing seaward we call it *ebb tide*.

The Cause of Tides. At the time of the new moon, when both the sun and the moon are on the same side of the earth, they are drawing by the force of gravitation in the same line. (See Fig. 103.) At this time the tide is much higher than at those times in the month when the moon is drawing along one line and the sun along another. (See Fig. 104.) At full moon, when the sun is on one side of the earth and the moon on the other, there is also a very high tide. (See

Fig. 105.) The tide wave, like a wind wave, moves more slowly as it approaches the shore. Hence the tide wave reaches the shore some hours after the moon has passed that meridian. Sailors need to know when high tide will

be, so as to take advantage of it for entering or leaving ports with shallow harbors.

High and Low Water; Tidal Bores. The difference between high and low water varies in amount in different places. In enclosed seas like the Mediterranean and the Baltic there is practically no tide, while in others there is a change of several feet. The highest tides are found in funnel-shaped inlets like the Bay of Fundy, where they reach a height of more than fifty feet above low-water



FIG. 106. A small beach in California. The action of the water is slowly wearing away the rocky shore.

mark. On gently sloping shores the advancing or retreating tide may extend over a great breadth of surface—perhaps a mile or more. On steep shores very little land is exposed between high tide and low tide.

The tide rushing in and out of the mouths of estuaries prevents the sediment or detritus brought down by the rivers from accumulating there, and helps to keep harbors sufficiently deep for the use of large vessels. In some estuaries the tide advances in a



FIG. 107. A straight, regular, sandy beach, built along a gently sloping shore.

series of great waves so that the time between low and high water is only a few minutes. This phenomenon is known as a *tidal bore*, and is particularly well developed at the mouths of the Seine and the Yangtse-kiang rivers.

Questions and Exercises

- (1) What kind of work is done by waves on a rocky shore? On a sandy shore? (2) Tell about the work of waves on a shore you have seen or about which you have read.
- (3) Describe a shore at high tide; at low tide; draw a picture of each.
- (4) How does the rise and fall of the tide affect the ways of the people living on the shore?
- (5) Make a list of the large tidal estuaries on the east coast of the United States; on the east coast of South America; on the coast of France. Opposite each write the name of a town on that estuary.
- (6) Would a tide run farther up the Mississippi River or the St. Lawrence? Why?



FIG. 108. A small beach in New Brunswick built up by the accumulated detritus. Note the lagoon behind it.

XVI. SHORE FORMS

The Deposits Made by Waves and Tides.

Waves and tides are constantly wearing away the land and moving the detritus produced by their own work or brought to them by the rivers. In an indentation of the shore line or at the foot of a cliff we usually find accumulations of detritus called *beaches*. (See Figs. 102, 106, and 108.) If the beach is pebbly the pebbles are washed back and forth and banged together until they are worn into sand. The finer detri-

tus is carried into deep water and there deposited, while much of the coarser is swept along the shore and temporarily deposited. The detritus deposited offshore forms shallows in the ocean, or builds up the continental shelves off coasts where continental shelves

are found. It is over these shallows that fish are most abundant. The Grand Banks off Newfoundland, the great fishing ground for American vessels, is an excellent illustration of a shallow area on a continental shelf.

On gently sloping shores, where plains border the water, there is usually a beach which may be many miles in length. (See Fig. 107.) Sometimes on such coasts the waves break at a distance from the shore and an accumulation of detritus is built up, which, when it reaches the surface

of the water, forms a continuous offshore beach known as a *barrier beach*. Between the barrier beach and the shore line there is usually a *lagoon* of more or less quiet water into which a river flows. The barrier beach is sometimes broken every few miles by a narrow channel which makes it possible for the lagoon to be used as a harbor.

The materials carried along shore are often built out into the quiet water behind points on the coast, as at the mouth of an estuary, forming a sandy projection of the beach known as a *spit*, if it is

built out straight, or a *hook*, if it is curved. Rivers may also form spits and hooks behind a point or behind islands. (See Fig. 109.)

Sea Caves and Promontories. Where the waves break with force at the foot of steep and rocky cliffs, they often wear away little



FIG. 109. A hook formed in a river.

caves, sometimes called *ovens*. When the cave is cut so deep that the overlying rock falls of its own weight, the cliff is worn back. Caves formed in this way are numerous along the coast of Maine.

The weak rocks bordering a body of water are worn away more rapidly than the strong rocks, and the latter often project as *headlands* or *promontories*. The end of such a promontory is usually called a *cape*. (See Fig. 111.) Capes are also sometimes built of sand where the waves and currents build a sand spit out into the waters.

The Work of Corals. In the warmer regions of the world, as about Florida, there are many islands and reefs built up under the water from the bodies of small animals known as *corals*. The coral animals build a strong skeleton from the food they secure from the ocean water. As they grow upward they die below, leaving the stony coral material as their foundation. They can grow only where the water is warm and continually in motion.

Some of these coral islands, especially in the Pacific Ocean, are more or less ring-shaped, with a quiet body of water or *lagoon* inside. Such a coral island is known as an *atoll*.

Ancient Shore Forms. Sometimes a great area of land once covered by water is exposed. This may be due to the raising of the land above its former level, or to the settling of the water because of evaporation or drainage. In such a case the land forms which have been made by the deposits from the waters, or by the cutting of the waves, are left as evidences of the former presence of the water. A knowledge of the land forms built by the waves, tides, and currents enables us to explain the



FIG. 110. A ledge, rounded and scratched by a glacier, in Bronx Park, New York City.



FIG. 111. The wave-cut shore of Cape Blanco, showing a headland and an island.

history of many regions once covered by water, but from which the water has now disappeared. These old forms are found in many parts of the world, but some of the best examples are about Great Salt Lake in Utah, where the old shores rise in places more than a thousand feet above the level of the lake, showing its former great extent.

Questions and Exercises

- (1) Describe a pebbly beach you have seen. Tell where it was; the size and shape of the pebbles; what wore them away; where the pebbles came from. (2) Draw a picture of a cliff you have seen that was being worn away. Tell where it was. Show, if you can, where the detritus from the cliff was being carried. (3) Make a list of the states in the United States that have barrier beaches. Name a city on such a beach. (4) What is a lagoon? Find one on the map of the United States.

XVII. GLACIERS

What a Glacier Is. A very long time ago the northern parts of North America and Europe were covered by a great mass of ice similar to that now found about the south pole and that covering most of Greenland. These great masses are known as *continental*

glaciers. The work they did in changing the shape of the land is well illustrated by the work now being done by the smaller glaciers occupying the upper portions of river valleys in parts of Switzerland, Alaska, northwestern United States, and certain other regions of the world. (See Figs. 115 and 116.)

The ice of the glaciers is formed by the accumulation of snow which, for many years, has been packed into a solid mass by its own weight, very much as a boy can pack soft, white snow into a hard, bluish snowball.

The Work of Glaciers. Glaciers are not stationary, but move slowly outwards over



FIG. 112. A drumlin in Massachusetts. Notice the lack of trees and the half football shape.

the land, scraping and scratching as they go. Large rocks are picked up and bodily carried along; small rocks are rubbed together and ground to pieces; while the fragments in the bottom of the ice scrape over the land, leaving scratches in the rocks, which show the direction in which the ice moved. (See Fig. 110.) Regions that have been covered by glaciers have thus lost a large part of the soil that was once formed by the slow weathering of the rocks. The hilltops have been rounded, and the ice as it melted has left the deposits scattered irregularly over the land, particularly in the river valleys. (See Fig. 113.)

Moraines. Where the ice melted at one place for a considerable time, great masses

of unsorted detritus of many kinds and of all sizes, from very fine powder or rock flour to boulders as large as a small house, were left, forming an irregular ridge known as a *terminal moraine*. (See Fig. 113.)

A great terminal moraine extends across North America from the island of Nantucket, through Marthas Vineyard and Long Island, across New York Bay, central New Jersey, and northern Pennsylvania, and thence irregularly westward and northwestward to the upper Missouri River. The whole country north of this line, except for a large area in Wisconsin, was once covered by a great glacier. As the ice melted back from this southern position, it left its deposits scattered over the country in the form of many small moraines. (See Fig. 180.)

Drumlins. In some places the glacier deposited long, rounded hills, in shape like half a football, which are known as *drumlins*. (See Fig. 112.) The outlines of these hills are very smooth, and they are usually free from trees. Drumlins are found in great numbers in Massachusetts, in central New York, and in a portion of Wisconsin. The waters made by the melting of the ice also deposited great quantities of sand in many parts of the country. This sand remains in the form of rounded hills or flat plains.

Lakes and Waterfalls Due to Glaciers. In the depressions of the moraines and sand



FIG. 113. A terminal moraine on Staten Island, with its rolling, irregular surface and rounded hills.



FIG. 114. A soil section of a drumlin showing character of detritus and effect of weathering.

accumulations, many lakes are now found. The river valleys were partly filled by glacial deposits, and when the rivers began to flow again along the lowest lines in the surface of the land, the water filled the many depressions amid the deposits and formed lakes which were later connected by streams. This is the reason for the occurrence of thousands of lakes in the glaciated areas of North America and Europe.

As the rivers flowed they began to deepen their channels, and in so doing, in many places cut down to hard rocks lying below a thin accumulation of glacial deposit. At such points *waterfalls* were formed. The waterfalls which have been of such great importance to New England and New York for manufacturing purposes are nearly all the result of the work of glaciers. The value of the waterfalls in the glaciated area

of the eastern United States is much increased by the fact that glacial soils readily hold water, so that the streams are not subject to drought during the season of least rainfall.

Soil Formed by Glaciers. The detritus left by the glaciers, as it weathers, forms very rich soil, because it is made up of so many kinds of rock. (See Fig. 114.) In New England, where the glacier moved over very strong rock, thus producing great numbers of boulders, the surface in many places is still so covered with these loose rocks that it can be tilled only with great difficulty. In the central western states, as, for example in Ohio, the glacial detritus contains but few boulders, and is spread so evenly that the surface is a gently sloping plain which can be easily tilled.

Valley Glaciers. *Valley glaciers*, like those of Switzerland and Alaska, also carry deposits scattered along their sides, and deposit them in the form of *lateral moraines*. (See Fig. 115.) These glaciers often carry many streaks of glacial deposit down the center of the ice, showing where the lateral moraines of two streams of ice came together. These are known as *medial moraines*. (See Fig. 116.)



FIG. 115. A valley glacier in Washington. The lateral moraine deposits are on each side.



FIG. 116. A valley glacier in Switzerland. The medial moraine is shown at the junction of the two glaciers.

Questions and Exercises

(1) Which of the pictures in this chapter shows that the rock has been scraped and scratched by a glacier? (2) Compare a glacier with a river. (3) Where does a glacier deposit detritus? (4) What is a terminal moraine? (5) Trace the terminal moraine of the United States. Name towns north of this moraine in whose vicinity you might expect to find glacial boulders, heaps of detritus, scratched rocks, and rounded hilltops.

(6) Make a list of the states which contain glacial lakes. Locate the largest and most important of these lakes and tell some of their uses. (7) Why should New England and New York be such important manufacturing regions? (8) Find out the names of several leading manufacturing towns in the glaciated area and tell why factories should be located there. (9) Why should Ohio be better fitted for farming than New England?

(10) To what parts of Europe and North America would you go to see a valley glacier? (11) What rivers of Europe are fed by melting glaciers? (12) Which of these rivers flow through lakes? (13) Where in Europe would you look for a terminal moraine? A medial moraine?

(14) Where do Alpine rivers deposit much of the detritus they have brought from the foot of the glaciers? (15) What plain has been built up of such material? (16) Why should such a plain be fertile? (17) Why would you expect such a plain to have a dense population?

(18) Why is it hard to tell a terminal moraine? (19) Why should stone fences be common in New England? (20) Why are more farms found in the valleys of New England than on the higher lands? (21) Why are drumlins often known locally as "long hills"?

XVIII. DISTRIBUTION OF PLANTS

Where Plants Grow. The land on which we dwell, the water of the ocean, rivers, and lakes, and even the air, furnish a home for enormous numbers of different kinds of plants. Many of these plants are of great importance, as they furnish us the materials for food, clothing, and shelter, or because they serve as food for animals.

Land plants thrive best where the soil, temperature, and moisture are best suited to furnishing them the food necessary for their growth. The character of the climate determines the length of the growing season; and the length of the growing season determines the distribution of the various species of plants over the world; for some plants grow in a few weeks, while others require many months. We therefore find plants varying widely in their character from the polar regions toward the Hot Belt. Plants grow most luxuriantly where the soil is fine and rich, as it is in the great alluvial plains of our



FIG. 117. A dense forest growth in Washington.

largest rivers, and where the moisture is abundant.

Vegetation Regions. We may distinguish three great kinds of vegetation regions: *Forests*, in which the trees grow high above the grasses and shrubs and other forms of plant life (see Fig. 117); *grasslands*, where trees are practically absent, except perhaps along the rivers, but where grass abounds (see Fig. 118), and *deserts*, in which plant life is very scarce, except the prickly forms like our cacti. (See Fig. 126.)

The most luxuriant forests are the tropical forests found in the Hot Belt. Between the Hot Belt and the Temperate Belt, where the rainy season comes only once a year, we find much open grassland, known as *savannas*. (See Fig. 119.) The well-watered portions of the temperate region have extensive forests, the

drier parts are deserts, while between the desert and the forest areas are the temperate grasslands, or *steppes*. (See Fig. 119.) In the North Cold Cap, where the growing season is short, there is an extensive boggy area known as the *tundra*, in which grasses and mosses grow in abundance. (See Fig. 119.) The coldest polar regions consist of barren, icy deserts where few plants grow.

Vegetation and Altitude. As the climate changes in ascending a mountain or a high plateau, so the vegetation changes at various altitudes, even in the Hot Belt. We may find the plants of several different vegetation regions on any high mountain, while the top of the mountain may be snow-capped and an

ice desert the year round. Thus mountains may form little plant islands, banded from foot to summit with widely different forms of vegetation, and rising in the midst of a great region whose vegetation is all like that found at the base of the mountain.

Vegetation and Slopes. Winds are the great carriers of moisture, and since it is moisture that determines the difference between a desert, a grassland, and a forest, anything that causes the winds to lose their moisture greatly affects vegetation. The distribution of mountains as related to wind systems is, therefore, very important. The

windward side of mountain ranges receiving the moisture-laden breezes from the oceans is usually forested. The leeward side, being dry, may be as barren as a desert. Lowlands, with their gentle slopes, usually contain



FIG. 118. A temperate grassland with scattered groups of trees.

great numbers of lakes, bogs, or swamps if situated in the moist regions of the world.

In a hill country the gentler slopes are usually devoted to crops and grass fields, while the steeper slopes are given over to forests and to grass for the pasturage of cattle. Steep slopes do not hold soil as easily as gentle slopes. Crops planted on hillsides are therefore liable to be washed out during a heavy rain. It is best to have hillsides devoted to vegetation that covers the ground closely like grass or trees. Thus we see that the form of the land has an important effect upon the distribution of vegetation.

Tropical Forests. The tropical forests are the regions of the densest vegetation in the

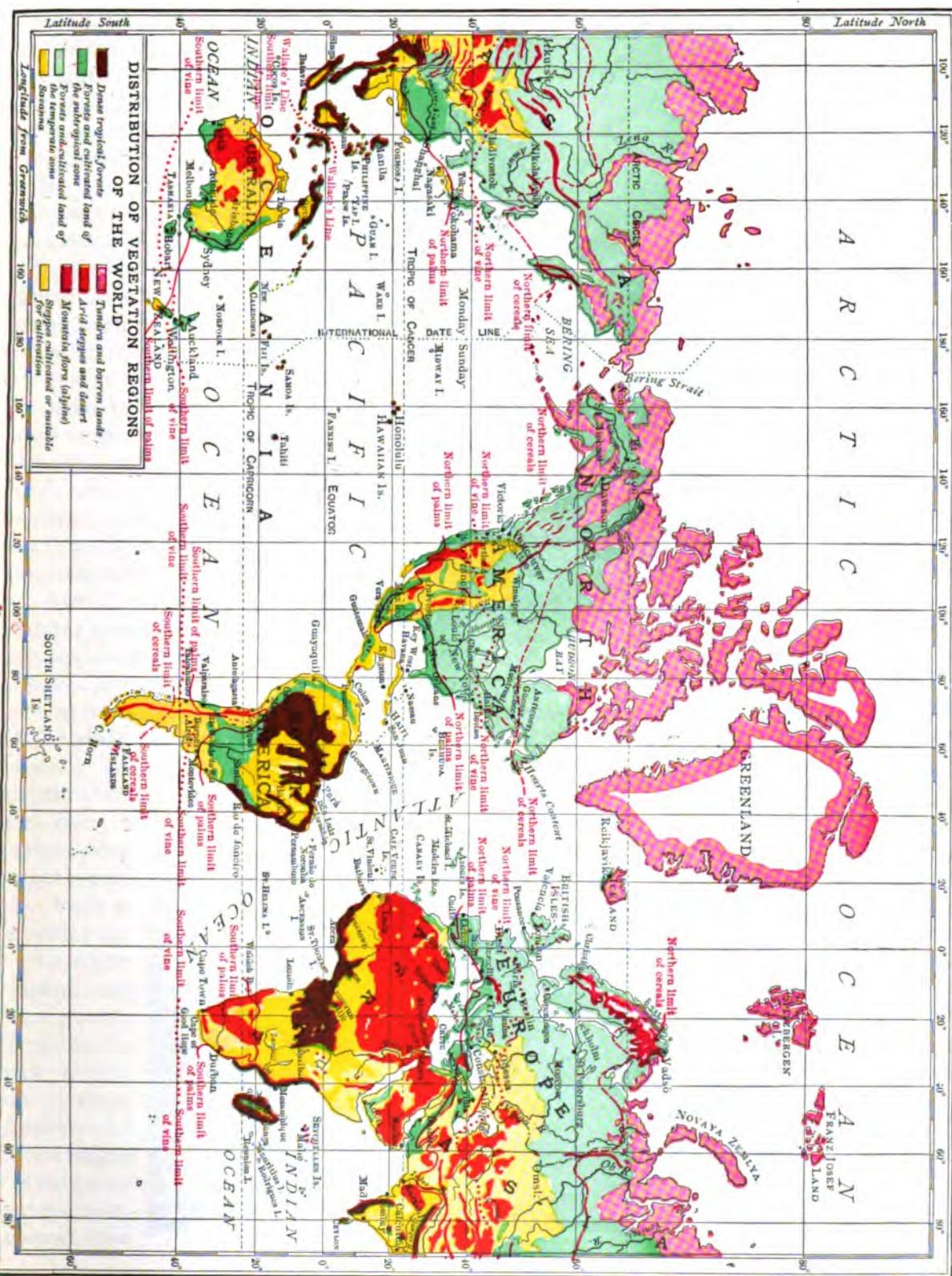


FIG. 119.

world. As they lie near the Heat Equator with its almost daily rains, they have abundant moisture. The warmth is great and the sunshine ample, for the sun shines nearly twelve hours every day in the year. The conditions are so favorable that the vegetation is almost inconceivably dense, producing what are known as *tropical jungles*.

In addition to the trees, which may grow to a great height, the ground is covered with grasses and bushes, and over the trees and around their trunks

twine creepers and the roots of plants that take their food from the air. As a result, the foliage is in places so dense that the forest is dark and gloomy. The greatest tropical forests are those of the Amazon and the Congo, and those of the East Indies.

The forms of vegetation growing in these forests are for the most part unfamiliar to those who live in the northern part of the United States unless they have seen them in green-



FIG. 120. Tropical palm, showing the peculiar trunk growth.

of bamboo, a giant grass rising to a height of sixty or seventy feet, and used in various ways the world over, especially in the manufacture of furniture.

Savannas. The regions near the northern and southern tropics, as we have seen,

have but one rainy season a year. At that time all vegetation bursts forth and grows abundantly for a few weeks, and the whole region is covered with green grass and blooming



FIG. 121. A rhododendron thicket in North Carolina.

flowers. When the rain stops, everything dries up and turns brown and gray; grass cures on the stalk and furnishes food for cattle. The temperature here is never below sixty degrees, and the rainfall ranges from ten to forty inches a year.

These grassy regions, which are known as *savannas* in many parts of the world, are found in Central America, in the valley of the Orinoco (where they are known as *llanos*), south of the wet jungles of the Amazon (where they are called *campos*), just north and south of the wet jungles of Africa, in southeastern Asia, and in northern Australia. (See Fig. 119.)

Temperate Forests. The most progressive nations as well as the densest population of the world lie in the belt of *temperate forests*. In the Northern Hemisphere this belt includes many kinds of trees; in the northern portion mostly evergreens, and in the southern portion largely deciduous trees which shed their leaves annually. The southern portion of this region, which borders on the tropics, is sometimes called the subtropical forest, because most of its trees cannot live where the



FIG. 122. Palmetto trees in a subtropical forest.

temperature is even cool. (See Figs. 121, 122, 123, and 124.)

The people of the eastern part of the United States live in the region of temperate forests, though the forests have largely disappeared. This is clear when we remember that trees practically covered the ground before white men came to America, and that, if the region is not cultivated for a year or two, it at once begins to grow up to trees. The region of temperate forests has abundant rains, well distributed through

the year, and in those parts where the sunshine and the rainfall are both abundant, as they are in the southern portions of the belt, we find both deciduous and evergreen trees.

We shall learn more concerning the valuable plant products of this region as we study about our own country and the continent of Eurasia. Owing to the great variety of plant life that grows in the temperate forest region, the people can carry on almost every possible occupation. Agriculture, grazing, and lumbering depend entirely, of course, upon the distribution and kind of plants. Owing to the variety of natural riches and because of the healthful



FIG. 123. A Spanish oak with its hanging moss.



FIG. 124. Pine growth in a temperate forest region.

climate, the temperate forest region produces a large portion of the food products of the world.

Arid Deserts; Oases. In the interior of the continents and on the leeward side of the great mountain ranges, particularly in the westerly wind area and in the trade-wind belts where the wind blows constantly

over the land, or has lost its moisture on a mountain barrier, we have regions of arid desert, where but little vegetation grows except on the higher mountains. The arid deserts, therefore, have few resources, and are mostly occupied by wandering people, dependent upon the flocks which they drive from place to place in search of food.

Where vegetation exists in the desert, it is usually in the form of spiny or fleshy cacti or similar plants, although there are some shrubs and bushes. (See Figs. 125 and 126.) In the few places where water comes to the surface, forming natural camping grounds for people moving through the desert, and furnishing water for the soil, we

have small garden spots known as *oases*. The oases within the desert, Sahara, are so important that they are better known than many large towns in more densely inhabited regions. (See Fig. 481.) The arid and the cold deserts are the most thinly populated regions in the world.

Steppes. In the Temperate Belts, lying between the temperate forests on one side and the arid deserts on the other, are regions of semi-arid country in which the rainfall is between ten and twenty inches. These regions, or *steppes*, are natural grasslands and great grazing countries. (See Fig. 128.)

The population is rather thinly scattered, but with the increased use of irrigation, by means of which water is secured for agriculture, grazing is gradually giving place to agriculture.

A large part of our western plains is a steppe



FIG. 125. Desert vegetation.

region, but the great steppe land of the world is east, west, and north of the Caspian Sea



FIG. 126. Characteristic spiny cacti from an arid desert.

in Eurasia. Steppes also extend over a considerable portion of South America, South Africa, and eastern Australia, in all of which regions grazing is an important industry.

Tundras and Ice Deserts.

As we go toward the poles from the temperate regions the vegetation becomes dwarfed and the trees fewer. Finally trees and bushes are left behind, and we come to a region in which only berries, mosses, and quick-blooming plants grow in a thin surface layer of soil from which the frost has melted and which will support vegetation for only a few weeks in the short summer. This region is known as the *tundra*. It is largely occupied by wild animals and by hunting tribes who live in the edge of the temperate forests or on the seashore in winter, and hunt in the forests in summer. The people wander from place to place and live in homes that can be easily moved.

In the Northern Hemisphere, north of the tundra and on the border of the frozen deserts, dwell the Eskimos, who live entirely upon animal food, gained chiefly from the ocean. In the vast ice fields of the frozen desert about the north and south poles no people can live. These regions are the great unexplored areas of the world.



FIG. 127. A view of the Nile and the Pyramids.



FIG. 128. Grazing on the steppes of the western United States.

Questions and Exercises

(1) Make a list of the tropical forest trees that you have seen or would recognize from a picture. (2) Draw a picture of one you have seen. (3) On an outline map of the world color with blue the tropical forest region. Write the name of a town in each continent in this region, and beside it write in figures the amount of yearly rainfall of this town with its January and July temperature. (4) What are the chief products of this forest region?

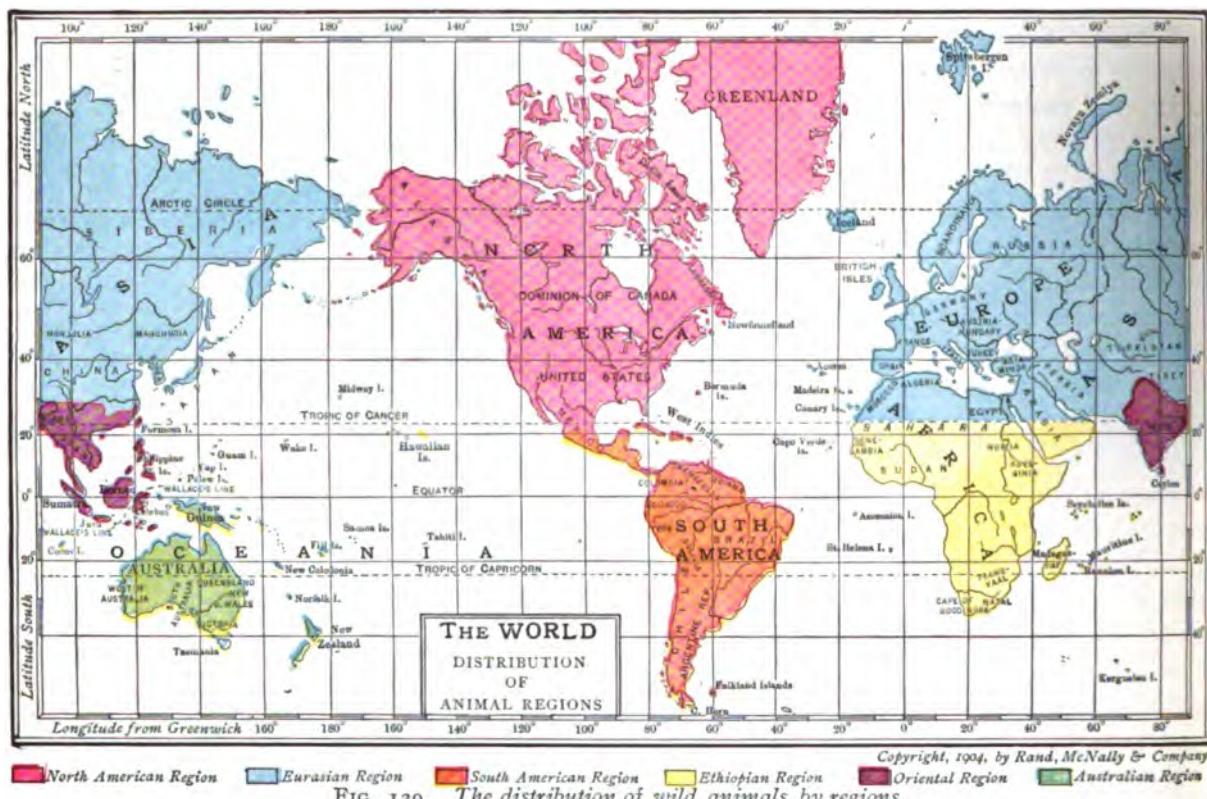
(5) Make a list of the trees of the temperate region that you know, and mark with a cross those that grow about your home. (6) Are deciduous trees or conifers most abundant?

(7) On an outline map of the world locate the chief grasslands. (8) In which continent are the grasslands called steppes? Plains? Campos? Llanos?

(9) On the same outline map color in deep yellow the arid deserts of the world, and in light yellow the tundra regions. (10) Write in your map the names of the chief animals of the tundra region and draw a line under those which are useful to man. (11) What do you know of individuals who have penetrated the ice deserts? How have they managed to live

there? (12) Draw a picture of a plant island in the Hot Belt. (13) If you have climbed a high mountain describe the change in vegetation from the base to the summit. (14) How can you account for this change? (15) Had this mountain been glaciated or not? (16) How

do you know? If you live in a hilly region describe the vegetation on the hills and compare it with that of the valleys. (17) Why does the grass grow green more quickly in spring near streams?



XIX. DISTRIBUTION OF ANIMALS

The Dependence of Animals upon Plants.

The distribution of animals over the world is closely related to the distribution of plants, for all animals depend directly or indirectly upon plants for their food.

Animals, however, can move about in search of food, and therefore are not so likely to die as are plants if the food or water supply fails because of a bad season. Great numbers of animals live solely upon plants. We call such animals *herbivorous*. Others, like the great cat



FIG. 130. A group of moose.



FIG. 131. A fallow deer.

family, which includes the lion and the tiger, live upon other animals, and are called *carnivorous*. (See Figs. 143 and 148.) But as the victims that furnish them food depend upon grass and vegetation for their sustenance, plants are of importance to them also. Other animals, including man, eat both plant and animal food.

Animals also need shelter and a certain degree of warmth. Some animals, like seals and certain birds, have a very wide distribution, moving from place to place with the season so as to secure food and comfort. Others live only where the particular food which they need is found.



FIG. 132. *The white polar bear from the Arctic regions.*

The animals of the land are numerous and of many kinds, but include only a part of the living creatures of the world. Living creatures abound in the ocean also; some swim freely from place to place, remaining usually in waters of a certain temperature, however; others, like oysters and clams, and the corals of which we have spoken, live on the bottom of the ocean in its shallower parts, and are dependent upon the waters that move by them for their food.

Relation of Animal Characteristics to Regions. We may study the distribution of animals as we have done that of plants, according to whether they live in the deserts, the grasslands, or the forests. In the grasslands the larger animals include our common cattle, buffaloes which formerly lived in such great numbers in North America, and the many forms of deer and antelope. (See Figs. 130, 131, and 135.)



FIG. 134. *The large Kodiak bear of Alaska.*



FIG. 133. *The coyote of the western United States.*

In the tropical forests we find apes, bats, and many of the animals that live almost entirely on nuts and fruits. In the outskirts of the forests and the grasslands are found the carnivorous animals which prey on the animals of both these regions. They are often the color of the grass in which they live.

The animals of the desert are nearly all a grayish brown, being similar in color to the desert region itself. Of these the coyotes of our western plains and the prairie dogs of the same region are good illustrations. (See Fig. 133.)

In the steppe region, where the land is brown during the dry season which prevails the larger part of the year, the animals are a brighter brown. In the tropical forests many of the insects and birds are green like the region in which they live. The green parrots, sometimes



FIG. 135. *A group of buffaloes.*



FIG. 136. A chamois.

like the region in which they live. (See Fig. 132.) Other polar animals, like the Arctic fox and the bird known as the ptarmigan, are white in winter but change their color in summer when the snow has disappeared for a short time.

Animal Regions and Resemblances.

It has been found better, however, to consider the distribution of animals in



FIG. 137. A group of elk.

accordance with their general resemblances. All of North America north of Central America, all of Eurasia north of the Himalayas, and Africa north of the desert, Sahara, have many animals which are alike. These are the bear, the elk, the reindeer, the fox, the wolf, and many others. This area, which is sometimes grouped as one *animal region*, includes the greater portion of the land of the world. (See Fig. 129.)

kept as pets, and the many-colored humming birds of South America are tropical forest-dwellers.

The Arctic animals, like the polar bear, are white

In the extreme north where the lands of the Eastern and Western Hemispheres lie near together, the animals are very much alike. Toward the south the lands are more separated in the two hemispheres and the animals vary more widely.

North American and Eurasian Regions. Northern North America, however, has so many animals that are different from those



FIG. 138. Wild Canada geese.

of northern Europe and Asia that it is usually considered as a region by itself, which we may call the *North American Region*. Among the animals which are found only in this district are the musk ox, the skunk, the prairie dog, the wild turkey, and the raccoon. (See Figs. 134, 138, 139, and 140.)

Among the animals which were once found only in the northern parts of the Old World, which we may call the *Eurasian Region*, are the mole, living in the ground, the rat, sheep, goat, and camel. Many of these forms have been brought to America by the white people and are now widely scattered throughout the Western Hemisphere.



FIG. 139. Wild turkeys.



FIG. 140. A musk ox.

South American Region. In Central and South America there are many forms of animals found nowhere else in the world. The true monkeys, with their long tails which they use in climbing; the ant-eaters; the



FIG. 141. Alligators of the southern United States.

armor-covered armadillos; the largest flying bird in the world, the condor; many humming birds; and the great ostrich-like bird known as the rhea, are distinctive of this region, which is known as the *South American Region*. (See Fig. 142.)

The puma and the jaguar, both great cat-like animals, extend into North America, and the tapir is found both in South America and in southeastern Asia.

Ethiopian Region. South of the desert of Sahara, which is so barren and dry that animals cannot readily migrate across it, is the vast area known as the *Ethiopian Region*; this contains many animals not found elsewhere. The great hippopotamus, living in the rivers and swamps of the hot regions of Africa; the long-necked giraffe; the striped, horse-like zebras and the smaller quaggas; the ostrich, the largest walking bird in the world; the great man-like gorilla, and the chimpanzee, live in this region only. Here also are found great num-

bers of antelopes. (See Figs. 144, 145, 146, and 147.)

Many animals of the Ethiopian Region are also common in southeastern Asia. Among others that might be mentioned as common to both regions are the lion, the leopard, the panther, the hyena, the elephant, and the rhinoceros, which are frequently seen in our circuses and zoological parks.

Oriental Region. In southeastern Asia, which lies in the Hot Belt and therefore has an abundance of rainfall



FIG. 142. The condor, the largest flying bird in the world.



FIG. 145. The striped, horse-like zebras.

and vegetation, we find a great number of carnivorous animals, including those already mentioned, and also the tiger, which is native to this region only, but which sometimes ranges far north over Asia nearly to the Arctic Circle. The animals of this district, which is known as the *Oriental Region*, are kept from migrating into the Eurasian Region to the north by the great mountain barrier of the Himalayas and the other mountains which lie to the north and west.



FIG. 143. An African lioness.



FIG. 144. The chimpanzee.

Australian Region. The islands close to Asia, including Sumatra, Borneo, and the Philippines, have animals similar to those of the Oriental Region. Across a narrow channel of deep water which separates these islands from those of the north coast of Australia is the *Australian Region*, in which the animals are entirely different from any we have mentioned. In fact, the difference is so great that this line of separation is known as *Wallace's Line*, named for the eminent scientist, Alfred Russell Wallace, who first showed the reason for the great difference between the animals of the Oriental Region and the Australian Region.

In the Australian Region we find no animals like those of any other part of the world except the domesticated forms like horses, dogs, sheep, cattle, and rabbits, which have been carried there by white men. The most interesting perhaps are the mammals, which suckle their young. The mammals of Australia differ from nearly all others because they carry their young in a pouch of skin in the underside of the body. The largest of these pouched animals, or *marsupials*, are the kangaroos, which can leap rapidly by

using their strong hind legs and great tails. (See Fig. 151.)



FIG. 146. *The double-horned rhinoceros.*



FIG. 147. *The hippopotamus.*



FIG. 148. *The tiger.*



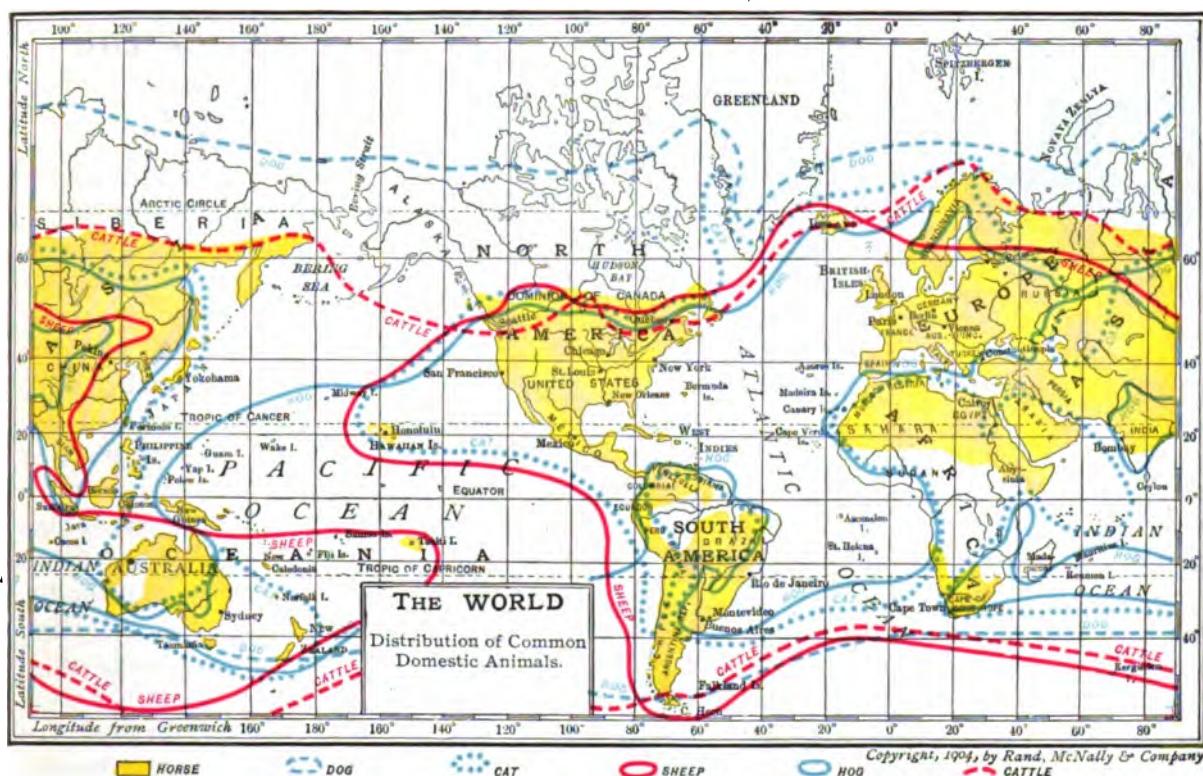
FIG. 149. *The elephant.*

Here also we find animals which are mammals, but which lay eggs, like the duck mole. The birds also are peculiar. The largest bird is the emu, somewhat like an ostrich, which can run very fast. Many of the birds are very beautiful, like the bower bird, which builds a nest of bright-colored objects, the brilliantly colored cockatoo, and the lyre bird, whose great tail gives it its name.

Domestic Animals.

Among the animals which are most broadly distributed over the world are those which have been domesticated or made useful by man, which can live in various climates and whose food man supplies, if it cannot be secured by the animals themselves the year round. (See Fig. 150.)

The house dog is found wherever people live. As it requires but little care and readily becomes a friend to man, it has followed him in his wanderings more than any other animal. In extremely cold countries, where vegetation is lacking, dogs are much used for drawing loads, because the necessary animal food can be readily carried, when it would be impossible to transport enough plant food for horses.

FIG. 150. *The distribution of our common domestic animals.*

The house cat, another very widely distributed animal, is found almost universally in those regions occupied by the white peoples, but less among savage or primitive people, because it cannot be domesticated as easily as the dog. In North America it appears nearly everywhere south of Hudson Bay, and through Central America. It is found around the coast of South America, and extends farthest inland in the Argentine Republic. The cat is also distributed

throughout the larger part of Europe and Asia, except in northern Asia, in the occupied region of Australia, and along the east and west coasts of Africa south of the deserts. It is found in few islands of the Pacific except in the Hawaiian group, which is occupied by white people.

The horse lives all over the world except in the tundras and cold deserts, in a part of Australia, and in the equatorial jungles of Africa and South America. Sheep and cattle are distributed over the world wherever they have proved an advantage to men, and where food can be readily secured for them.

Horses, sheep, cattle, and hogs are the most important of the domestic animals, because the

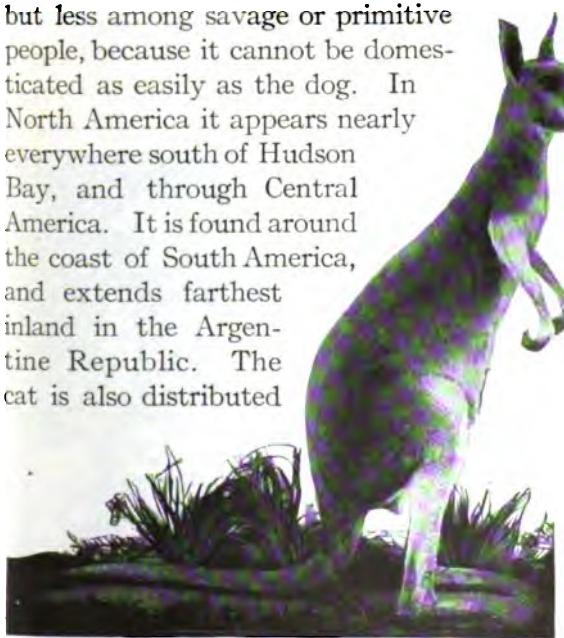
FIG. 151. *The kangaroo.*FIG. 152. *The cassowary.*



FIG. 153. *The orang-outang.*

horse is the great draft animal of the world, and the others are the chief food-producing animals. Sheep are also important for their wool, and cattle for their skins.

The camel is the most useful domestic animal in the deserts of southwestern Asia and northern Africa. Its feet are so shaped that they do not sink into the sand, and it can go long distances without food or water. Hence the camel is used almost everywhere in the hot, dry desert, both for traveling and for transporting goods.

Questions and Exercises

(1) Make a list of the animals that live in the desert region. (2) Choose one and describe its appearance and habits. (3) Do the same for the tropical forest region, the tundra region, and the grasslands.

(4) What advantage is it to animals of any region to be similar in color to their surroundings? Give illustrations of this from the different vegetation regions.

(5) Name any plants or animals that are now at home in North America which have been brought from other continents. (6) Make a list of animals peculiar to South America and mark with a cross those whose pictures you find on these pages. (7) Do the same for the Ethiopian region. (8) Name the countries in which you can find in its native home the condor; the camel; the giraffe; the armadillo; the gorilla; the emu; the boa-constrictor.

(9) Locate Wallace's Line. (10) Why has this line been drawn? (11) Describe one of the Australian animals. (12) Why cannot animals readily migrate over mountains or across deserts? (13) Why are the animals of the North American and Eurasian regions so closely similar?



FIG. 154. *Camels used for traveling in deserts.*

XX. THE PEOPLE OF THE WORLD

The Distribution of Mankind. We do not know exactly how many people there are in the world, but the number is estimated at nearly 1,600,000,000. Mankind is distributed very unevenly. The regions of permanent ice on the mountains and about the poles are uninhabited. Deserts contain very few people, except around the oases, and the hot, moist jungles also are practically uninhabited.

The largest numbers of people are found in the lowlands near the seashore, where the climate is not too severe for outdoor labor the year round, and where there is sufficient moisture to raise the crops necessary for food. The most densely inhabited region of the world, outside of certain small areas in some of the largest cities, is in the low plains of southeastern Asia. (See Fig. 169.)

The most progressive nations live in the coastal portions of the Temperate Belts where the summers are not too hot and the winters not too cold, and yet where there is enough contrast between summer and winter to make it healthful. In the occupied regions of the Hot Belt the people are not so energetic and advanced as they are in the cooler Temperate Belts. White people cannot live



FIG. 155. *A schoolmaster in India, a dark-skinned Caucasian.*

permanently in many tropical regions except where the altitude is sufficiently high to give a cooler and drier climate than is found in the lowlands.

The White Race. The largest number of people belong to the *Caucasian* or *White Race*. The members of this race have oval faces, small mouths and lips, large, narrow noses, and straight eyes. They are the most active, enterprising, and imaginative race of the world; they speak many languages and are divided into many nations. Some people of the Caucasian race are very dark-colored, so that really two great groups of white people exist, the dark-skinned and the light-skinned. The light-skinned live in the cooler portions of the temperate belts, while the dark-skinned occupy the warmer parts of this belt and the subtropical regions. (See Fig. 155.)

In earlier times the white race lived only in the Eastern Hemisphere. From there they have emigrated in search of new homes or better opportunities for living, until now they are found in all regions where the climate is favorable for progress. They are found in great numbers throughout the larger part of North America, Europe, South America, and in the coastal regions of Australia, and are increasing in the tropics.



FIG. 156. Italian children, dark-skinned Caucasians.



FIG. 157. Children of Burma, whose people belong to the Brown Race.

The Yellow Race. The next largest number of people is found in the *Yellow Race*, which occupies almost all of Asia, and northern Europe. This race is sometimes called the *Mongolian Race*, named for Mongolia in China. One branch of this race, inhabiting southeastern Asia, is sometimes called the *Brown Race*, because of its deeper color. The people of the yellow race are shorter than those of the white race, and have coarse, black hair, small noses, and small black eyes, with the outer corners a little elevated. As a rule they are not progressive and include

some of the most backward tribes of the world. The Japanese, Chinese, Eskimos, and Laplanders all belong to the yellow race. The Japanese are the most progressive and enterprising of this race. (See Figs. 157, 158, and 159.)

The Red Race. The third great race is the *American* or *Red Race*, sometimes considered as belonging to the Yellow Race.

The Red Race is found only in America, and it includes all the native peoples of the Western Hemisphere except the Eskimos. By native, we mean the peoples who do not, by birth or descent, belong to the Eastern Continents. The people of the red race have a yellowish, copper-colored skin, long, coarse, black hair, small round eyes,

and are about the height of the white race. Most of the red race are but little civilized, although a few are just beginning to develop industries which will furnish products of value to the rest of the world. The Indians do not readily show their true nature to strangers and hence are little understood. Usually considered a sullen and cruel people, this reputation is often far from just. (See Figs. 160 and 162.)

The Black Race. The fourth and last group of people is the *Black* or *Negro Race*. Their native home is in the tropical region of Africa, in Australia and the neighboring islands. Negroes were formerly brought to America as slaves, and now are found in the warmer portions of North and South America in great numbers. (See Fig. 163.)

The Negroes that we know in this country have a dark brown or black skin, short, black, kinky hair, very broad, flat noses, large round eyes, large teeth, and thick lips, and are about the same height as white people. As a race they are somewhat indolent, like other peoples whose homes are in tropical countries; they are often impulsive in their actions, but are faithful and affectionate to any one for whom they care.

In central Africa, in certain parts of southern Africa, and in a few of the islands of the world are the Negritos, who are like the Negroes in many ways, but much shorter; some of them are not more than four feet in height. These people are not found anywhere except in their native homes. The natives of Australia belonging to the Negro Race are the lowest and most uncivilized people of the world. They live almost entirely

on the food to be obtained from the animals and the plants about them, and they furnish few products of value to the rest of the world, except those which they can gather from the forests or animals without much labor.

Questions and Exercises

(1) On an outline map of the world, mark in dark brown the most densely populated regions.

(2) What countries are they in? (3) Locate a town in each region, and write on the map the name of the race found in the greatest numbers in this town.

(4) Make a list of the countries inhabited by the Caucasian Race; the Mongolian Race; the Negroes.

XXI. THE PEOPLE OF THE WORLD (*Continued*)

Savage People. Everywhere people must secure food, clothing, and shelter in some way, but the manner of procuring these necessities differs among different races, and even among different divisions of the same race.

The lowliest people are those who get their living entirely by hunting and fishing, or by digging edible roots, or gathering the fruit of plants that grow about them. These people we

call *savage*. There is no division of labor among them, every man seeking the necessities of life for his family without help. Usually, however, the men are the hunters, while the women gather the roots and carry the burdens on a march. Their homes are extremely simple, and many have no fixed abode, moving about over the country as they wish, and setting up a hut or shelter wherever they go.

These hunting and fishing races are found only in small numbers in a place because they



FIG. 158. A Japanese girl.

need a large area to furnish the necessary food for a few people. In the colder regions they dress in skins, but in the warmer regions they wear few clothes. Their implements are simple, and consist chiefly of cooking utensils, spears, clubs, and other hunting implements. Some of them do not even have the simple bow and arrow, so well known among our western Indians.

Barbarous People.

Those people who carry on grazing or primitive agriculture, that is, who raise crops from the soil or follow flocks and herds about the country, are called barbarians, and are more advanced than savages. (See Figs. 159 and 165.) People who live by their herds and wander from place to place are called *nomads*.

Some nomadic peoples, like the Arabs of Asia and Africa, live in villages, each of which is made up of a few families. These people carry on agriculture in a simple way and have developed certain industries and made tools to help them in their work. Even among these people, however, there is little division of occupation, except between the men and the women. Each family or tribe secures for itself all that it needs for sustaining life.

Civilized People. The highest group is that known as *civilized*. Among civilized

people many varied industries are followed, and, as a rule, each worker devotes his attention to some one particular thing, with a view to exchanging or trading the product he cannot use for other things which he needs or desires, and which other people, for some reason, can produce better than he can.

The Industries of Civilized People.

The larger number of the civilized people of the world live in the country. They are engaged

chiefly in agriculture, grazing, mining, or lumbering, occupations which cannot be carried on in densely populated regions. These people

live mostly in permanent homes, although in grazing and, to some extent, in lumbering, the men have to leave their homes for many months in the year. They make use of many inventions and tools unknown to the barbarous and savage peoples. They devote greater attention to their home life, to the education of their children, and to the development of new industries and of commerce. They also build cities and towns,

because they have found it advantageous to live in as large groups as possible.

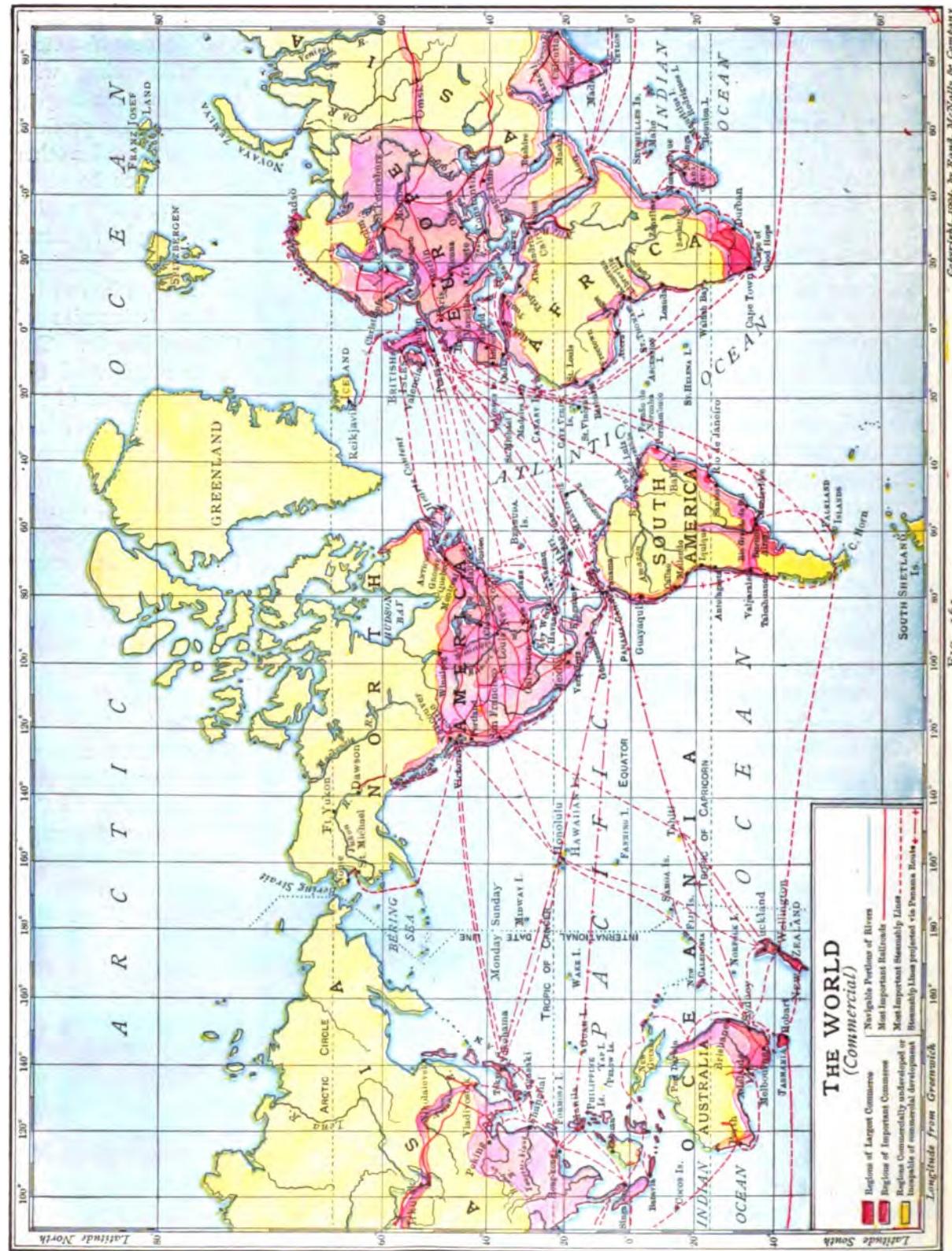
The products secured from the earth through the industries mentioned, furnish the materials which are manufactured or



FIG. 159. *Tunguses of Siberia.*



FIG. 160. *Indian children of North America with their decorated dress.*



changed in some way before they can be used. We find, therefore, many thickly settled areas in which manufacturing and trading are the leading occupations of the people. Groups of people gathered together for these purposes in one place form a town or city. It is in the towns and cities that we find the greatest business activity and the greatest use of modern conveniences and luxuries. Every occupation except mining, lumbering, and hunting can be illustrated in a large city like New York.

The people who are confined in factories or business houses do not have the freedom of life that people living in the country enjoy, and in many respects their life is less pleasant and healthful.

Commerce and Trade. The people engaged in the different industries mentioned are all producing articles for use or exchange. The buying and selling and transporting of goods from one part of the world to another is known as *commerce* or *trade*.

The simplest form of commerce is the exchange of one article directly for another, which is known as *barter*. This is seen sometimes in small country towns where the farmer takes his products to the store and exchanges them for the goods he desires. Years ago the miner *bartered* when he took to the trading store the nugget of gold he had dug from the earth. A hunter or

trapper often brings in skins to exchange for food and other things he needs.

In most commerce, however, *money* is used. Money is usually made from some valuable metal that will not readily wear out, and that can be exchanged for anything else. In commerce, therefore, a man exchanges the products he has to sell for money, such as bank checks or drafts, and then buys other things at his convenience.

Transportation. In early times local commerce on land was carried on almost entirely by means of caravans of camels or horses. (See Figs. 154 and 166.) The

cost of transportation was so great that, of course, only the richest and the most valuable products could be transported in this way. People living close to a great sea like the Mediterranean early learned navigation and thus oceanic commerce developed.

A large part of the trade of the world is now carried on over the oceans. (See Fig. 161.) Formerly large bodies of water were a hindrance to commerce because they interrupted land transportation. Now in many places the land

is a hindrance to commerce, because it interrupts water transportation, which for long distances is much cheaper than transportation by land.

To overcome land obstructions and to



FIG. 162. *Moki Indian girls of Arizona.*



FIG. 163. *Australian negro children.*

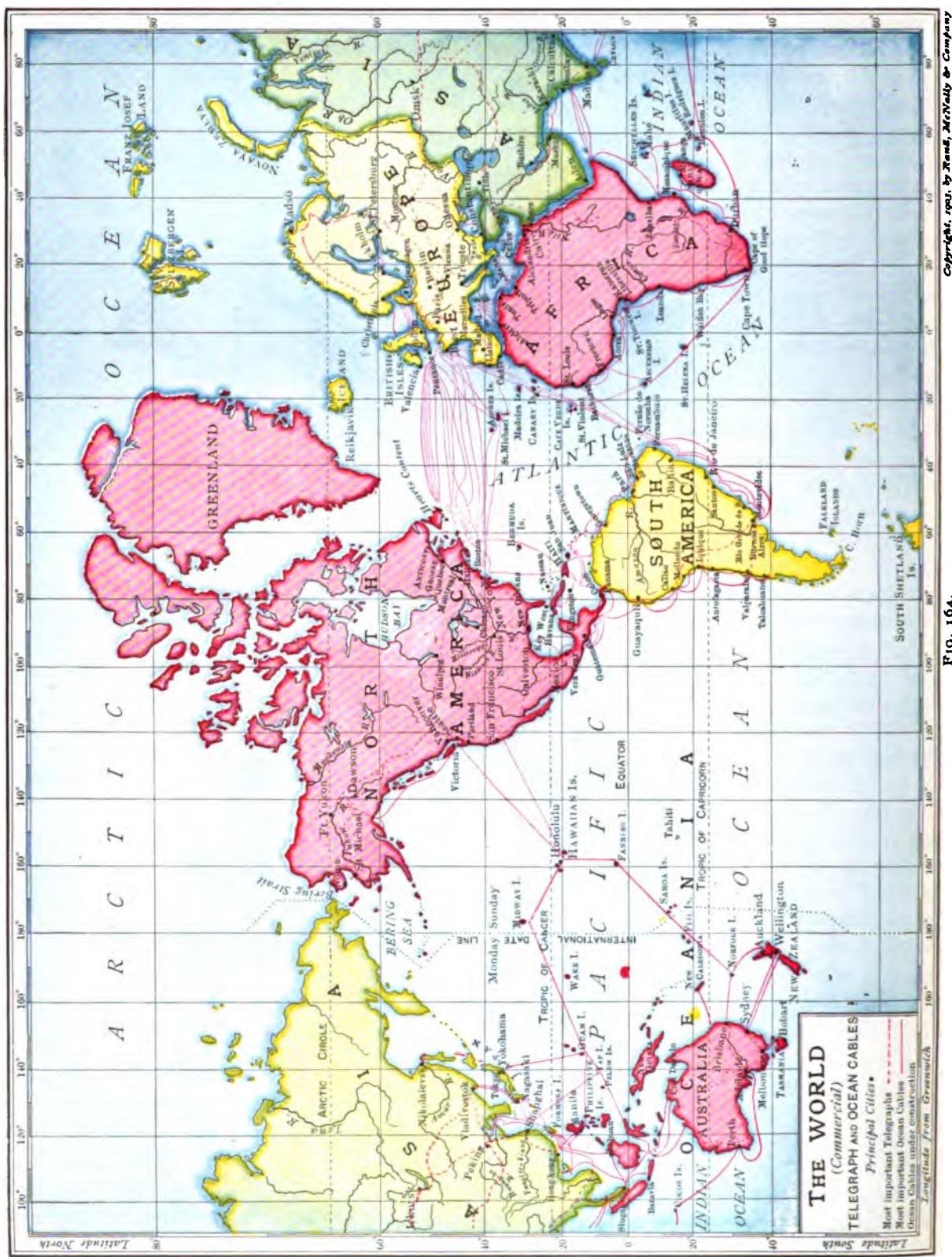


FIG. 164.

provide continuous highways of water along lines of valuable trade, men build canals. The canal which will soon be built across the Isthmus of Panama will be of vast importance because it will shorten many of the much-used water routes of the world. (See Fig. 167.)

Water commerce is also carried on along the navigable rivers, between different places on the coasts of a country, and along canals which have been built to connect navigable rivers or lakes.

Land Commerce. Land commerce is now conducted largely by means of railroads, although, in some of the more rugged and thinly inhabited portions of the world, goods are still transported by caravans, by wagons, by pack animals, and, in some places, even on men's backs. (See Fig. 166.) Certain commodities, like oil and gas, are transported from place to place through great pipes that have been laid underground for many miles.

More and more of the power developed by great waterfalls is now being converted into electricity and carried long distances by means of wires stretched above the ground like telegraph and telephone wires. This power is chiefly used for electric lighting, and for running street railways and machinery.

Methods of Communication. With the development of commerce, quicker communication between one part of the world and another has become necessary. The most common means of communication between people who want to engage in business is by letters carried from place to place

by the mails. When the greatest haste is desired, messages are also sent by means of the telegraph or the telephone.

Telegraph cables across the Atlantic Ocean have been in use since 1866, and in the year 1903 two cables were completed across the Pacific Ocean. Now all the great countries of the world are connected with one another by telegraph. (See Fig. 164.)

The latest invention for rapid communication between places is what is known as wireless telegraphy, by means of which messages are sent through the air from one point to another many hundred miles away by electricity.

Government.

The successful development of any community depends largely upon whether people regard the rights of their neighbors, or whether they try to live for themselves alone. In every group of people some form of

government is necessary, because there are always some individuals who will not do as they should unless they are made to do so. Government has arisen also because there are many things which everyone in a community needs, but which a few people attend to better and more cheaply for the community as a whole. The Postoffice Department and the Lighthouse Service are perhaps the best illustrations of conveniences that can be provided for by the government better than by each person for himself.

The Forms of Government; the Home.

The simplest form of government is that of the *home*, in which the parents establish certain rules which must be obeyed in order



FIG. 165. *The winter home of a nomadic Indian, New Mexico.*

that all the members of the family may live together in comfort and happiness.

The Village, Town, or City. The next largest form of government is the *village*, *town*, or *city*, which includes many homes and the lands surrounding them. In such a group some central form of government is necessary in order that one family may not interfere with the peace or comfort of the whole community, and in order that conveniences like streets and schools, which are of use to all, may be properly cared for.

In the villages of primitive people some one man, known as the *chief*, establishes the laws to be obeyed by all and settles troubles between individuals. Among most civilized people the officers to make and execute the laws are elected by the people. These officers act in the name of the community in establishing laws and in carrying on business which affects the whole community.

The State. Just as a village, town, or city includes all the families living therein, so the highest form of government, the *state* or the *nation*, is made up of all the communities within its territory. The officers of a state have control of all the public conveniences, like asylums and prisons, which are at the service of all the inhabitants.

In the United States, however, the term *state* has a restricted meaning. It is a division of government which stands between the community and the nation, and exercises some of the powers ordinarily exercised by a nation. Our national government establishes laws in reference to the relations of states, regulates affairs with other nations, maintains an army and navy, and attends to

all matters in which more than one state is concerned.

Democratic and Monarchical Government. A national government, all of whose officers are elected by the people, is called a democracy. If the officers are appointed by representatives of the people, the government is a republic. Our government partakes of both forms and is therefore properly called a democratic republic. The greater part of its officers are appointed, and all, whether elected or appointed, act in the name of the people. It is far different from a monarchy, where one man acts for the whole nation.

All these kinds of national government may differ in form, but they have grown up for the same reasons, because individuals living in groups cannot be allowed to act as they wish without thought for their neighbors, and because many matters arise which must be managed for the



FIG. 166. Loading a camel caravan.

benefit of the group as a whole.

Relation of Geography to Government. The need for some form of government has arisen everywhere because the geographical conditions have made it possible and advantageous for people to live in groups. The form of government, however, is not directly geographical, because it has been devised by men and not determined in its features by the geographical conditions to be found in any region.

Questions and Exercises

- (1) Where are savage tribes living to-day?
- (2) Why are barbarous tribes higher in civilization than savages?
- (3) Name ten rivers in the United States that provide cheap and easy transportation; ten in

Europe. (4) How is transportation interfered with on the Nile? The Congo? The St. Lawrence?

(5) Write the names of six countries of the world that have coasts favorable to commerce. (6) Opposite each place the names of the chief harbors of that country.

(7) Give instances where canals have facilitated land and water commerce. (8) Make a drawing showing the bodies of water which canals have connected.

(9) Which of all the races of man has taken the smallest part in trade? (10) Which the largest?

(11) In what way does good government promote trade? (12) What means does your government take to further trade? (13) What branch of our national government is of most help to you?

How Man Changes the Distribution of Water. Man modifies the distribution of water over the world in many ways. Water bodies he connects by means of canals (see Fig. 252), and the water from rivers and



FIG. 168. *A reindeer sledge, a means of transportation in cold countries.*

XXII. HOW MAN CHANGES THE GEOGRAPHY OF THE WORLD

Man is continually changing the geography of the world in many ways. He cannot change the climatic conditions, but he has learned to occupy many regions in spite of the climate. The white man can endure the cold of the

lakes he uses to irrigate his fields. Lakes are sometimes made by building dams so that the water may be used for irrigation or for power. Swamps and lakes are drained so that the land can be used for agriculture.

The mouths of rivers and estuaries are kept from filling or silting up by making the water pass through narrow channels so that the river detritus is carried far out to sea. The shores of lakes and oceans, particularly about harbors, are changed either by filling up the shallow water so as to make more land, or by deepening the water so as to make a larger harbor.

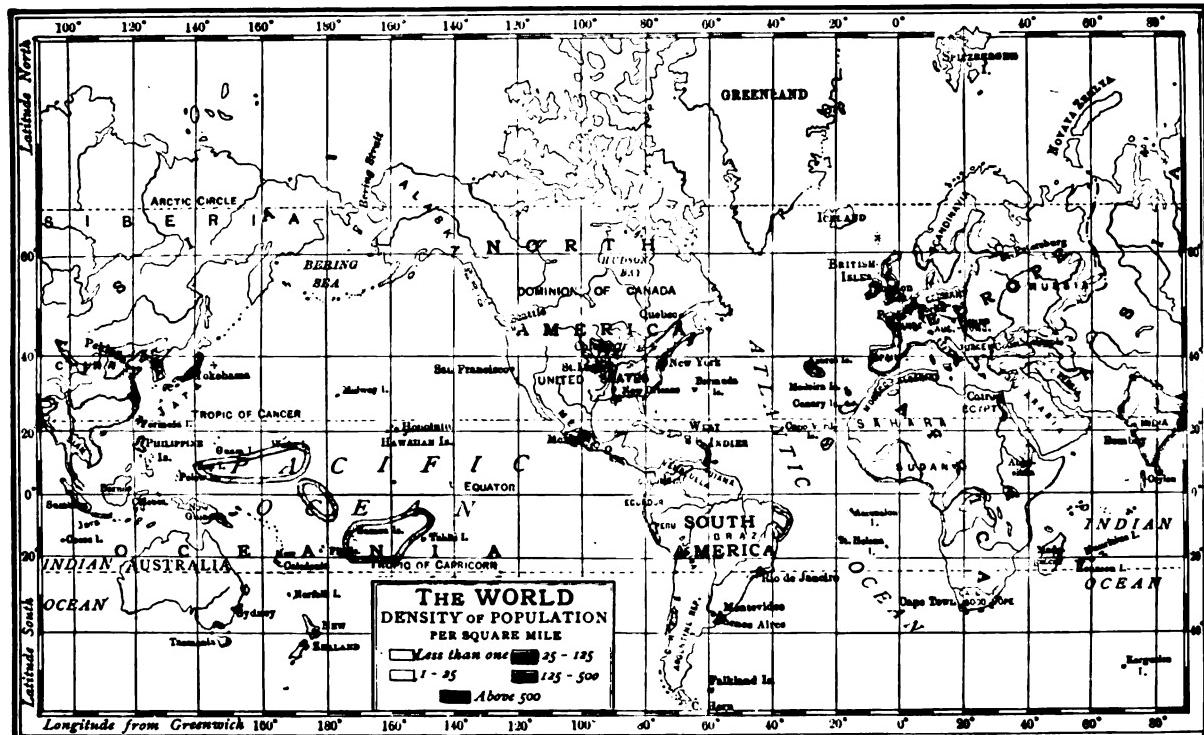
How Man Changes the Aspect of the Land. Man also changes the form of the land in many ways. He not only increases the amount of land in the way we have mentioned above, but oftentimes he

levels hills into plains. In other places he keeps the water from wearing into the river banks or hillsides, and thus preserves the land. Sometimes he turns rivers from their natural course in order to build a railroad or a canal, and in large old river valleys he builds levees to keep the water from flooding the lowlands.



FIG. 167. *A dam across the Oswego River, New York, to turn the water into the Oswego Canal, used for transporting products.*

polar regions if he builds comfortable houses and wears furs and thick clothing. (See Fig. 168.) He is constantly learning better how to live in the unhealthy tropical countries, but in all cases he lives in spite of the climate and not because he has changed it in any way.



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FIG. 169. A map showing the density of population of the world.

How Man Changes the Distribution of Plants and Animals. The greatest effect of man geographically, however, is seen in the distribution of animals and plants. The domesticated animals have been carried into remote parts of the world, and food plants have been made to grow wherever the climate and soil conditions permit.

Man has also extended the distribution of many plants and animals that are harmful rather than helpful. The seeds of weeds have been carried in grains and have run riot in new countries. Rats, mice, and vermin have been unconsciously carried by people as they have migrated into a new region.

Sometimes animals transported for the sake of their helpfulness have become nuisances, because they have developed so rapidly in the new country. In this way Australia was overrun by rabbits until now government action has been taken to try to exterminate them. The gypsy moth

brought into the United States with the silk-worm is now devastating the forests of the eastern part of the country in spite of all that people can do.

Increase in the Distribution of Man. These are only a few of the many ways in which man is continually making the distribution of certain animals and plants more general. The distribution of men themselves is continually becoming more complex, because, as old countries have become overpopulated, the people have migrated into new regions, until now the larger part of the land useful to civilized man is occupied. (See Fig. 169.)

Thus, while the natural features of the world influence man in determining what shall be his industries and form of life, and outline the area in which he can live, man in turn changes the natural features of the world as much as he can to suit his own desires and convenience, and to increase the area in which he can earn a living.

PART II

COMPARATIVE GEOGRAPHY OF THE CONTINENTS

NORTH AMERICA

XXIII. THE CONTINENT AS A WHOLE

Size and Position. North America is third in size of all the continents, has more than twice the area of Europe, and contains about one-fifteenth of the population of the world. (See Fig. 28.) In latitude it extends over 62 degrees, or nearly 4,000 miles, north and south. Its width is greatest in the far north, where it stretches over more than 168 degrees of longitude.

In the higher latitudes North America lies close to the Old World, approaching it most closely on the northwest where Bering Strait separates the land masses of Asia and North America by only thirty-six miles.

In the middle and southern latitudes, where the population is most dense and industrial life best developed, the distance between the Old and the New World is much greater.

North America includes the great countries of *Canada*, the *United States*, and *Mexico*, the several small nations of *Central America*, the many islands of the Caribbean Sea, generally known as the *West Indies*, and the large Danish island of *Greenland*.



FIG. 170. North America.

Coast Line. The coast line of North America is very long, and is greater in proportion to the land area than in any other continent except Europe. The most important large indentations are the *Gulf of Mexico* on the south and *Hudson Bay* on the north. The Gulf of Mexico, from its position in the

warmer portion of the continent, is extremely important commercially, while Hudson Bay is surrounded by unproductive country and is icebound for several months each year.

The Western Coast. The northern portion of the western coast of North America is extremely irregular, and abounds in fiords and sounds. It is also skirted by a series of offshore islands, similar to those bordering Norway.

Southward from Puget Sound the coast is unbroken except for the small inlet of San Francisco Bay and the Gulf of California. Hence the number of good harbors is small. These are centered about *Puget Sound* and *San Francisco Bay*, where navigable rivers break through the high wall of the Coast Ranges. (See Figs. 171 and 172.) The natural harbor of *San Pedro*, on the coast of southern California, has been improved so as to

accommodate the commerce of a region which is progressing with great rapidity.

The Eastern and Southern Coasts. The eastern coast of North America north of New York City is extremely irregular, and has many harbors ranging in size from that of *New York*, the most important in the country, to fishing havens just large enough to accommodate a few small fishing vessels. The harbors in this region are close together, and coasting vessels can easily reach shelter in time of storm.

South of New York the coast line is extremely regular, and is broken only at intervals by the occasional indentation of an estuary, like that of *Delaware Bay* or *Chesapeake Bay*, and by many small breaks in the coast bars which are excellent for small vessels. These two estuaries, together with the mouth of the *Mississippi*, are the main outlets for commerce in this region.

A large part of the southern Atlantic shore is bordered by a series of barrier beaches, separated from the mainland by lagoons. Some of these beaches extend out into the ocean as long capes, as *Cape Hatteras*, or as submerged spits which are dangerous to ocean commerce.

Bordering the eastern shore there is a broad, continental shelf, extending off New York, for instance, more than one hundred and fifty miles. (See Fig. 173.) The shallowest

water of this shelf is in the vicinity of Newfoundland. This area is known as *shoals* or *banks*, and abounds in valuable fishes. It forms the chief center of the fishing industry of Canada and the United States.

Surface. The surface of North America consists of two extensive highlands, extending in a general north-south direction, and two broad lowlands. (See Fig. 173.) Bordering the western coast from the Aleutian Islands to Panama is the great *Cordilleran*



FIG. 171. *The rocky coast of California looking into the Golden Gate.*



FIG. 172. *The rugged coast of Oregon, showing islands left by the wearing away of the weaker rocks.*

or *Western Highland*. Lower and less rugged than the Cordilleran Highland is the *Appalachian Highland*, which runs nearly parallel with the Atlantic coast from New Brunswick to Alabama. Between the Appalachian Highland and the Atlantic Ocean is the low-lying *Atlantic Coastal Plain*, which begins at New York City and extends southward into northern Mexico. Between the two highlands, and extending from the Arctic Ocean to northern Mexico, is the *Great Central Plain*, a vast tract of land, low in the east and rising in the west to meet the foothills of the Cordilleran Highland.

The fact that the highlands of North America extend in a general north-south direction is of great importance in determining the climate of the continent. The westerly winds from the Pacific Ocean are deprived of much of their moisture by the lofty Cordilleran

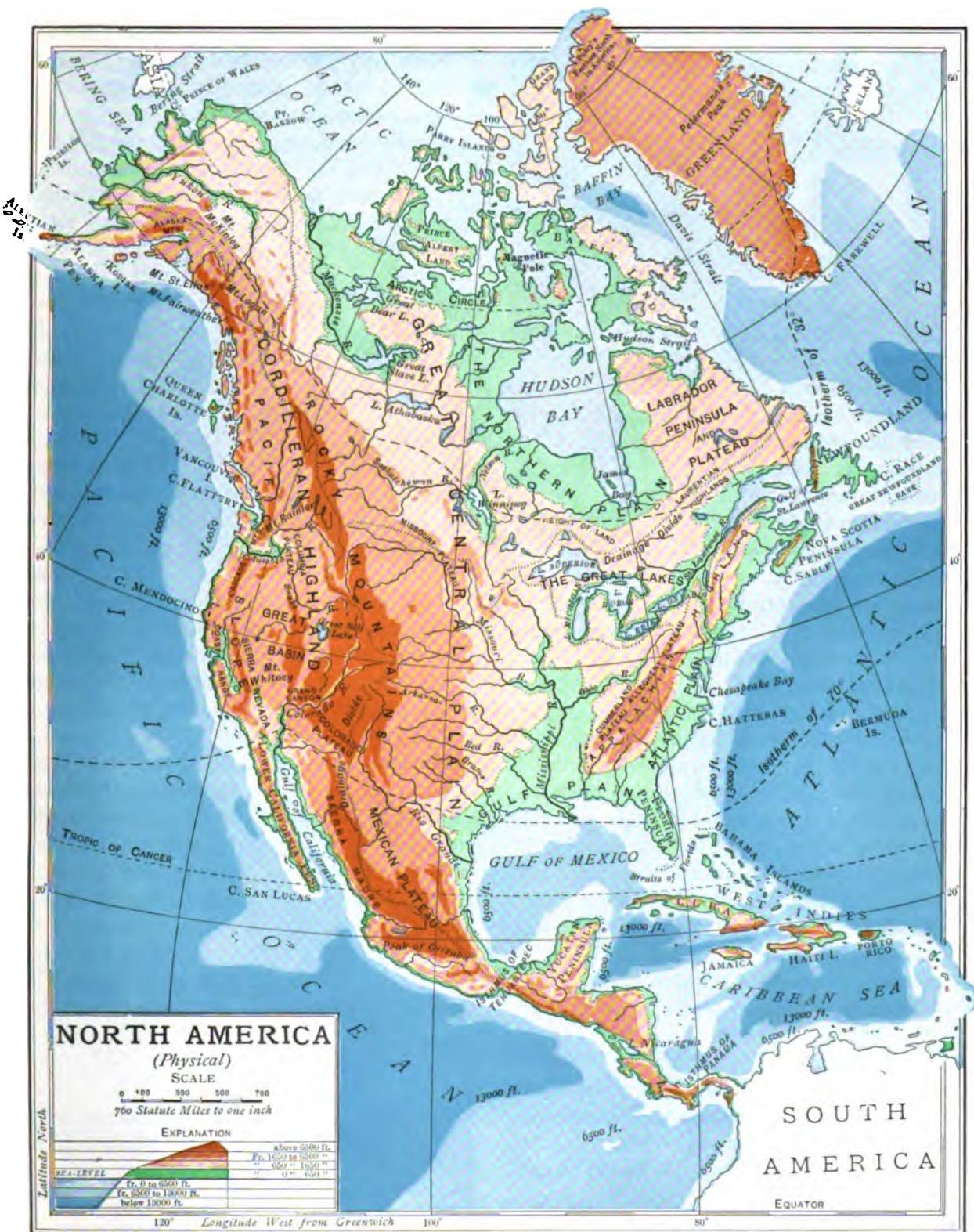


FIG. 173.



FIG. 174. *The Three Sisters, famous peaks in Alberta.*

Highland, while a large area of the western Mississippi Basin and the Plateau States lying to the leeward of the great mountain wall to the west has a scanty rainfall. In the continent of Europe the highlands extend, approximately, in an east-west direction, and hence the westerly winds, blowing from the Atlantic Ocean, can carry their moisture far into the interior of the continent. This difference illustrates clearly the relation between mountains, winds, and rainfall.

The Cordilleran Highland. The Cordilleran Highland begins in Alaska and extends southward into Mexico. In the north it is narrow and forms no serious barrier to travel between the coast and the interior of Alaska. The highland grows broader to the south in Canada and the United States, reaching its greatest breadth between Colorado and northern California. Hence in this region it is an important barrier to trade and travel, not only because of its height and breadth, but also because it deprives the westerly winds of their moisture and leaves the plains to the east dry and parched.

The Cordilleran Highland is made up of many different mountain ranges: the *Rocky Mountains* in the east, the *Sierra Nevada* and the *Cascade Mountains* in the west, and in the extreme west along the Pacific Ocean, the *Coast Ranges*. These mountain ranges inclose within their borders in the United

States two great plateaus—the *Columbia Plateau* and the *Colorado Plateau*—and an extensive area of interior drainage commonly known as the *Great Basin*.

The Rocky Mountains. The Rocky Mountains in the United States consist of many different ranges, separated from one another by high, level mountain valleys. They rise abruptly from the eastern plains and are broken by few water gaps or river valleys, so that the carriage roads and railroads crossing them are few in number. Some of the railroads which have been built to connect the eastern and western sections of the continent have been constructed at the expenditure of enormous sums of money.

The highest altitudes of the Rocky Mountains in the United States are in Colorado and New Mexico, where there are many peaks exceeding 14,000 feet in altitude.

The northern extension of the Rocky Mountains in Alaska and Canada includes *Mount McKinley*, the highest peak in North America, which has an altitude of more than 20,000 feet. Nearer the coast are two other great peaks which are nearly as high, *Mount Logan* and *Mount St. Elias*.

Plateaus. In the United States the western mountains of the Cordilleran Highland are separated from the Rocky Mountains by the *Columbia Plateau* and the *Colorado Plateau*, which lie along the rivers of the same names, and by the *Great Basin*. (See Fig. 173.) Farther north in Canada the east and



FIG. 175. *Peaks of the Rocky Mountains in the vicinity of Yellowstone Park.*

west mountain ranges come closer together and finally merge in one great highland mass.

Sierra Nevada and Coast Ranges. The western mountains of the Cordilleran Highland throughout the greater portion of their extent consist of two series of nearly parallel systems, the eastern and higher *Sierra Nevada* and *Cascade Mountains*, and the lower ranges bordering the Pacific Ocean, known as the *Coast Ranges*. The

Sierra Nevada and the *Cascade Mountains* are lofty and majestic and contain many glaciers and old volcanic peaks. They are deeply cut by numerous river canyons which are famous for their beauty, and taken together form one of the grandest scenic regions of the world. *Mount Whitney*, in the southern *Sierra Nevada*, rises to an altitude of nearly 15,000 feet and is the highest peak in the United States. The *Coast Ranges* face the Pacific in an almost unbroken wall, so that they give but little opportunity for settlement near the coast.

Highlands of Mexico and Central America.

In Mexico the Cordilleran Highland consists of a series of high mountain ranges close to the eastern and western coasts, and of the high Mexican Plateau lying between these ranges.

The western ranges, of which the *Sierra Madre* is the most important, contain many slightly active volcanic peaks. In Central America the mountains run more nearly northwest and southeast, but still form an almost continuous mountain wall close to the coast. The highlands border the western coast so closely that throughout a larger part of Mexico and Central America there is little opportunity for settlement near

the Pacific. Hence the population is sparse.

The Appalachian Highland. The Appalachian Highland extends from the Gulf of St. Lawrence to Alabama. It consists of the *Cumberland* and *Allegheny Plateaus* in the west, and the *Appalachian Mountains* in the east, with the *Great Valley*, a long, narrow depression containing portions of several rivers, lying between.

Compared with the Cordilleran Highland this eastern highland is only a gentle rise of land, for it is not more than 200 miles wide, and the greatest altitude is only a little over 6,000 feet. The

highest peaks are found in New Hampshire and North Carolina.

This highland is an extremely important feature of the surface of the United States because it lies to the east of the great interior



FIG. 176. *Crawford Notch, White Mountains.*



FIG. 177. *The White Mountains of New Hampshire.*

plains with their vast commercial products, and separates these regions from the most important seaports of the country. We will therefore study its features more in detail when we come to take up the several groups of states of the Union.

Atlantic Coastal Plain. The *Coastal Plain* which borders the Atlantic Ocean and the Gulf of Mexico is extremely flat and nowhere rises

much over four hundred feet above the sea. It is well watered by the many streams flowing down from the Appalachian Highland, which lies to the west, and contains large areas of valuable soil, which are well adapted to agriculture. The colonies of England planted in this region soon became prosperous and rich, and the coastal plain was the agricultural center of the country until the occupation of the Great Central Plain made the basin of the Mississippi the most important agricultural area in America.

The Great Central Plain. The *Great Central Plain*, lying between the Appalachian and the Cordilleran highlands, extends from the Arctic Ocean to the Gulf of Mexico. It is lowest along the great Mississippi River and the Mackenzie River in Canada. In the portion east of the Mississippi River the slopes are gentle and the altitudes low. The streams here are only slightly sunk beneath the level of the country and hence the relief is nowhere great.

West of the Mississippi River the plain rises gradually in altitude, reaching a height of about 5,000 feet where the mountains actually begin. Throughout the western portion of the plain the rivers have cut several deep



FIG. 178. A wheat field in Manitoba. Notice how level the Great Central Plain is in this region.



FIG. 179. A field of barley in Manitoba.

valleys, but these are far apart; as a result the surface in many regions has been but little modified by the rivers, and throughout large areas the plain extends to the horizon in broad, rolling swells, with hardly a break.

Owing to its gentle slopes and to the magnificent system of great rivers which flow through it, the Great Central Plain is an extremely important part of Canada and the United States, and is devoted largely to agriculture or grazing.

Glaciation. The surface features of northern and eastern Canada and the northeastern United States have been greatly modified by glaciation. (See Fig. 180.) A great glacier, originating somewhere in northern Canada, moved gradually out in all directions until it occupied this whole area, except a small region in Wisconsin. This sheet of ice was so deep that it covered the top of Mount Washington, the highest peak in the glaciated area of the United States. When the whole region was covered by ice it must have appeared much as the interior of Greenland does now, that is, as a broad snow and ice plain, unbroken by any points of land.

Throughout the glaciated area the soils were removed from the hilltops and dumped irregularly in the valleys; the rocks were scratched and grooved often to a depth of several inches, the scratches showing the direction from which the ice came. The great terminal moraine, already mentioned (see page 63), marks the southern limit of this ice sheet.

In the glaciated area nearly every stream is broken by rapids or waterfalls, due to

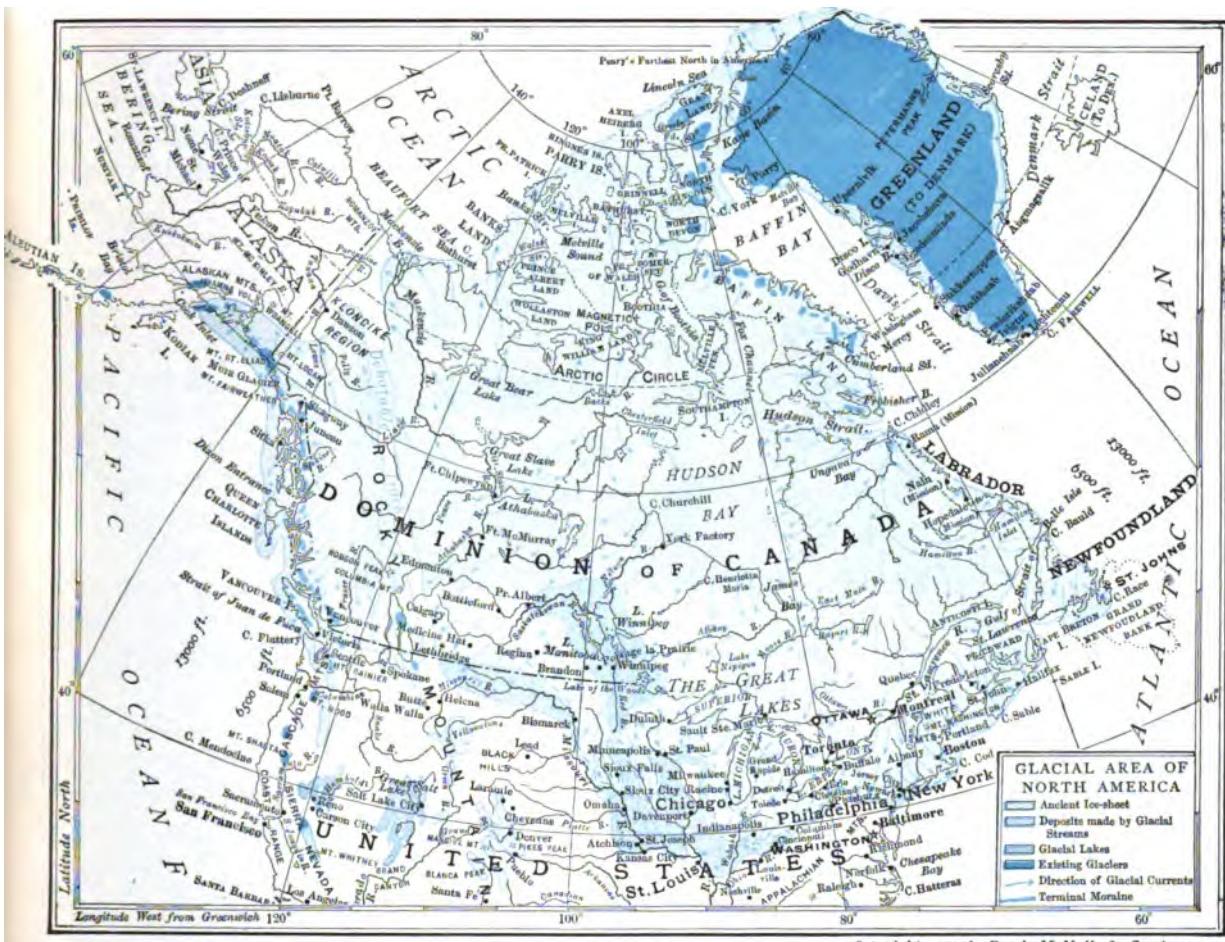


FIG. 180.

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the work of the ice. The whole country is also studded with countless lakes formed in the undrained depressions in the materials deposited by the ice. The formation of the Great Lakes was due in part to the action of the glaciers.

Drainage and Divides. The *Mississippi River*, together with its tributary, the *Missouri*, is the longest river in the world, and drains by far the larger part of the Great Central Plain of the United States. (See Fig. 173.) The larger rivers of this plain are all navigable for long distances; the Mississippi to St. Paul, and the Missouri to Fort Benton. The Mississippi System contains over 9,000 miles of navigable rivers, and hence furnishes a valuable route for

water commerce. A low divide, sometimes called the *Height of Land*, separates the basin of the Mississippi from the north-flowing streams which drain either into the Arctic Ocean or Hudson Bay. (See Fig. 173.)

The Rocky Mountains are in a general way the divide between the streams flowing to the Atlantic or the Arctic and those flowing to the Pacific. In the southwestern United States, however, the Continental Divide is west of the Rocky Mountains. In some places it is so inconspicuous that it is hard to tell when one passes from the basin of an east-flowing to that of a west-flowing stream.

Nearly all the streams flowing into the Pacific Ocean originate on the western slopes of the coast mountains, and are therefore

short and rapid. Only five large rivers rise east of these mountains and drain into the Pacific. These are the *Yukon*, the *Fraser*, the *Columbia*, the *Sacramento-San Joaquin*, and the *Colorado*, which flows into the Gulf of California between the southern continuation of the Coast Range and the great Cordilleras of Mexico. Thus the waterways to the Pacific are few as compared with those to the Atlantic, and in consequence the ports are not the natural outlets for the products of the rich agricultural and manufacturing areas of the States of the Pacific Coast.

In the northern portion of the Appalachians the divide between the rivers flowing into the Atlantic and the Mississippi is west of the highest mountains, so that several streams like the *Hudson*, the *Delaware*, the *Susquehanna*, and the *James* flow through the Appalachian Mountains in water gaps. (See Fig. 182.) Each of these river valleys thus forms a natural highway across the mountains, and is of great importance in present-day commerce, as it was in early exploration. In the southern Appalachians

the divide is along the eastern ridge of the mountains. The rivers flowing to the east from this divide are therefore shorter than some of the northern rivers already mentioned.

The basin of the *Great Lakes* and the *St.*

Lawrence River is separated on the north from the Arctic and Hudson Bay drainage by the low Height of Land already mentioned. The *St. Lawrence River* is interrupted by many rapids, around which canals have been built, so that in summer it is possible for ocean-going vessels to reach the upper end of Lake Superior or half-way across the continent. Thus, the *St. Lawrence River* and the Great Lakes together form the only natural water route into the interior of the country from the east, as the *Mississippi* does

from the south. (See Fig. 184.)

The divide between the Great Lakes Basin and the Mississippi Basin is in places very low. In fact, the divide between the *Chicago River*, flowing into Lake Michigan, and the *Des Plaines River*, flowing into the Mississippi, is only about fifteen feet above the level of the lake. The low and short divides between adjoining streams were of great importance during the exploration of the interior of the continents, because they offered the easiest portages. In many cases towns were developed at these carry-

ing places, especially in the Eastern and Northern States of the Mississippi Basin. Later these natural highways became the routes of canals and railroads.

Climate. North of the Tropic of Cancer North America lies in the region of westerly



FIG. 181. Crater Lake, high up in the Cascade Mountains. It lies in a great depression in the top of an ancient volcano. (See page 40.)



FIG. 182. The Delaware Water Gap.



FIG. 183.

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winds during the winter, while in the summer the Heat Equator extends as far north as Arizona. (See Figs. 82 and 84.) The larger part of the continent, therefore, lies in the region where the climatic differences between summer and winter are great. Owing to its size and position, North America has the most strongly marked continental climate in the world except Eurasia.

The Western Coast. The most uniform conditions of temperature and moisture are found along the western coast, where the winds blowing in from the Pacific bring the warmth and moisture acquired from the ocean. (See Fig. 97.) On the mountain slopes bordering the coast north of central California the annual rainfall is very heavy, in some places more than a hundred inches. (See Fig. 97.) In summer when the westerly wind system has moved north but little rain falls in this region even on the high mountain peaks, but in winter the mountains receive abundant rainfall as far south as southern California. The westerly slopes of the mountains in the rainy region, being well watered, are covered with magnificent forests. (See Fig. 119.) The eastern slopes and the interior valleys are drier and more barren.

The Great Central Plain. The great interior plain of North America is extremely cold in winter and hot in summer. The outblowing winds of winter are so dry that this region receives but little moisture at that season, except in the southern Mississippi Valley. In the summer growing season, however, when the winds blow inland, it is fairly well watered. The heaviest rainfall is in the eastern and southern portions. The warmest portion of the plains region in summer is along the lower Missouri River, and the center of the extreme continental cold in the winter is in Alberta. (See Figs. 82 and 84.)

The Eastern Coast. The eastern coast of North America has the most rapid changes in

weather of any portion of the continent. In winter when a storm center is occupying the interior, the northeast winds, passing over the cold Arctic Current, usually bring snow, while the southeasterly winds, coming from over the warmer North Atlantic Drift, bring rain. Inasmuch as the storms usually move from the southwest to the northeast, they follow a path nearly parallel to the Appalachian Mountains, and thus the rainfall is evenly distributed and one side of the highland is not dry and the other wet, as is the case in the Cordilleran Highland. The cold northwesterly winds of winter after the passage of a storm often cause extremely low temperatures, so that once in every seven or eight years killing frosts may extend even into southern Florida.

The Gulf Coast. Along the Gulf Coast, especially west of the Mississippi River, there are well-marked monsoon winds with the change of season from winter to summer. The summer winds blowing in toward the Mississippi Valley come from the warm waters of the Gulf of Mexico and carry an abundance of moisture, a large part of which falls as heavy rain near the coast. (See Fig. 97.) As a result the region about New Orleans has the heaviest rainfall found in the United States, with the exception of that in Washington and Oregon. (See Fig. 97.)

The western part of Texas, which is out of the range of the Gulf winds, is very dry.

In Mexico and Central America, where the prevailing climate is that of the trade-wind region, the east coast is wet and the west coast dry, although in no case a desert. As the winds rise in passing over the eastern slopes they lose the larger part of their moisture, so that the high plateaus in northern Mexico are exceedingly dry.

Vegetation. Northern North America, including the island region of Arctic America as far south as the coast of Hudson Bay, and the coast of Labrador, is covered by

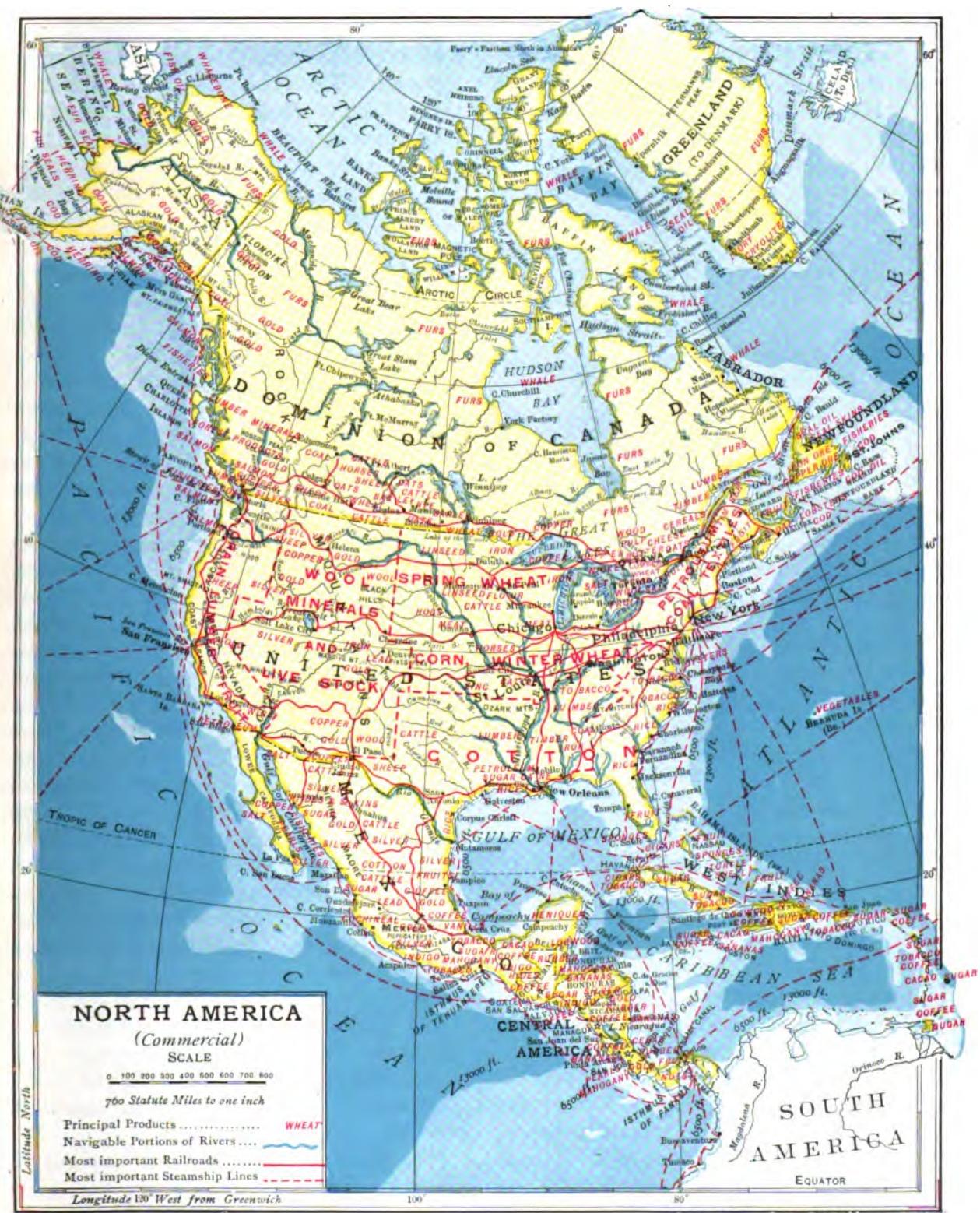


FIG. 184.

perpetual ice or by the grassy *tundra*. (See Fig. 119.) This vast area is unoccupied except by a few Eskimos along the coast, or by wandering Indians who hunt here in the summer months.

South of this area is the broad region of coniferous trees, which includes northern New England and the region about the Great Lakes. (See Fig. 119.) Hemlock, spruce, fir, cedar, and white pine, all valuable as lumber or for paper pulp, are the principal coniferous trees. Coniferous trees also cover the mountain tops and western slopes of the Cordilleran Highland where the climatic conditions, because of the altitude, are similar to those found in the higher latitudes. (See Fig. 185.)

The region east of the Mississippi River is a forest and grassland, with the uncultivated areas occupied by either coniferous or deciduous trees. The southeastern coast from Norfolk to New Orleans contains many palms and other subtropical trees, including the long-leaf or hard pine, which furnishes valuable lumber.

This forest and grassland area gradually merges on the west into the open, grassy prairies or steppes of the Mississippi Valley. Between the 100th meridian and the foot-hills of the Rocky Mountains the steppes are more arid and trees are practically absent except along the water courses. Within this arid steppe region there are small desert areas, but the largest deserts of the United States lie between the Rocky Mountains and the Sierra Nevada. Here the rainfall is

slight, as the winds have been robbed of their moisture in crossing the mountains lying to the west. This arid steppe region includes the plateau of Mexico. Central America is everywhere occupied by dense, subtropical forests or by savannas. These subtropical forests include many valuable timber trees, like rosewood and mahogany; also banana trees, rubber trees, and others that yield valuable commercial products.

Animals of North America. The characteristic wild animals of North America have

already been mentioned. (See page 74.) Many other animals not distinctive of North America, are found in great numbers in the wild and unexplored regions. Great herds of elk exist in Canada, and the grizzly, cinnamon, and black bear are common in the more rugged mountains of the western



FIG. 185. A great cedar forest in the Hetch-Hetchy Valley, California.

highlands of the continent. (See Fig. 137.)

People. Except for the Eskimos of Alaska and northeastern North America, the whole continent was formerly occupied by Indians. These Indians were of many tribes, speaking different languages, and ranging in civilization from the true savages to the barbarous tribes who practiced agriculture to some extent. Now the Indians of North America are almost wholly restricted to the western and northern portions of the continent and to the mountains of Mexico and Central America. (See page 79 and Fig. 186.)

The larger portion of North America is occupied by descendants from the early colonists sent out by the European nations,

or by immigrants who have recently come from Europe. The population is the largest in the eastern portion of the United States where the colonies established by the European nations were planted. English is spoken generally throughout the continent, although in some parts of Canada and Louisiana French is the prevailing language and in Mexico and Central America and for the most part in the West Indies, the people speak Spanish.

Within recent years there has been a great migration of people from Europe to America. Some of these immigrants have settled in the cities, but great numbers have made their homes in the extensive agricultural lands of western United States and southern Canada. Germans and Norwegians are very numerous in the northern states of the Mississippi Basin and the Irish and Jews are found in the larger cities.

In the southern Atlantic and Gulf states, in the West Indies, and in Central America where the warm climate makes it difficult to carry on constant labor, there are great numbers of negroes, mostly descended from slaves brought from Africa to till the plantations. The early Spaniards who came to Mexico and Central America married with the Indians, and their descendants, known as Mexicans, are now the most powerful people in these regions.

Questions and Exercises

- (1) On an outline map of North America write the names of the great countries and draw their boundaries. (2) Write the names of the surrounding waters and chief islands and groups of islands. (3) What is the scale of the political map of North America? (4) Using this scale, find distance between New York and San Francisco; between Montreal and Vancouver.



FIG. 186. Alaskan Indians and their home.

3. *Trade routes.* (a) Name the principal rivers of North America. (b) Name the great lakes and the chief streams which flow into them. (c) Name the great rivers of the Pacific Coast. (d) Name the principal rivers of the Great Lakes. (e) Name the principal rivers of the Mississippi River system. (f) Name the principal rivers of the Atlantic Coastal Plain. (g) Why did not the early explorers enter the Central Plateau by way of the Mississippi? (h) Mention a component which has no sea outlet way into the interior. (i) Calculate the difference in length between the route from Liverpool to Montreal, and from Liverpool to New York. (j) Which is shorter? (k) What disadvantages has the northern route?

(l) Which coast of North America has the greatest range of temperature? The least range? (m) Compare the annual range of Winnipeg and Sitka, Winnipeg and Quebec. (n) Which sections

have an even climate? Why? (o) What sections have a continental climate? Why? (p) What is the annual range of temperature in your home locality? (q) Have you an oceanic or continental climate? (r) Account for the heavy rainfall of the west slope of the Cascade Mountains. (s) Why does the Columbia Plateau get so little? (t) Why does Winnipeg have less rain than New Orleans? (u) What winds bring rain to the Atlantic Coastal Plain? To Quebec? To Vancouver? (v) What winds bring rain to your home? (w) Why are the plateaus of Mexico dry?

(x) What is the average rainfall of the tundra region? The steppe? The region of coniferous trees? Deciduous trees? The subtropical areas? (y) Make a list of these regions; opposite each write its rainfall and characteristic vegetation. (z) In which vegetation region do you live? (aa) How great is the rainfall at your home? (bb) Write a description of your most common tree or plant and illustrate by a drawing.

XXIV. THE UNITED STATES AS A WHOLE

Size and Extent. The United States, not including Alaska and the many dependencies, has an area of 3,025,600 square miles; that is, it is a little larger than the continent of Australia. Including Alaska, the Philippines, Hawaii, Porto Rico, and a few scattered islands in the Pacific Ocean, the area is 3,728,000 square miles, or nearly equal to that of all Europe. The United States

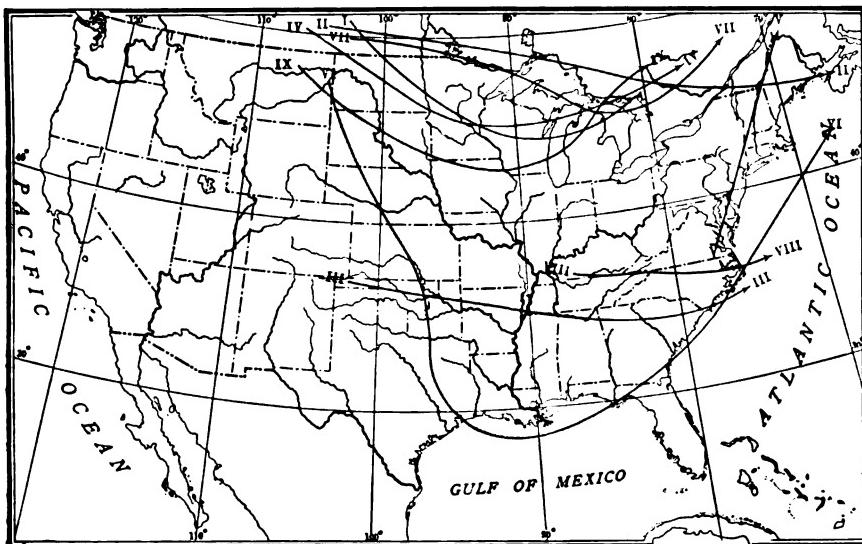


FIG. 187. *Storm tracks of the United States, showing the direction in which the areas of low pressure move across the country.*

extends from the Atlantic to the Pacific, and from the Great Lakes to the Gulf of Mexico. It therefore includes parts of all the great physical divisions of North America and has an extremely varied climate.

The crops that are raised in the different regions, the occupations that the people follow, and the distribution of the population depend very closely on the surface features and on the climate. Consequently we need to know something about the surface and the climate of the different sections of the country before we study the detailed geographic conditions in the several groups of states.

CLIMATE

The Climatic Regions. There are three great climatic regions in the United States: the *East Coastal* and *Gulf*, the *Interior*, and the *West Coastal*. Three similar divisions are found in Canada, but the climatic features there differ somewhat from those in our own country, owing to the fact that the United States is situated farther south, and therefore is, in general, warmer than Canada.

The East Coastal Region. The East Coastal and Gulf region includes all the area east of the Mississippi River. It is characterized by cold winters, warm summers, and an abundance of rain through the year.

In winter, storms and clear weather follow one another across the continent in rapid succession and bring sudden and severe changes of weather to the eastern states. (See Fig. 187.) A change of temperature of fifty degrees or more may occur in twenty-four hours. As a result the ground is

sometimes so thawed in winter that vegetation may start, only to be frozen again in a few days. It is for this reason that the fruit along the Atlantic coast is frequently damaged so that the crops are small. The inblowing stormwinds carry moisture from the ocean which falls largely as snow in the northern portion and as rain in the southern.

In summer, along the whole Atlantic and Gulf coast, the prevailing winds blow from the ocean; they therefore carry moisture to the continent, so that nearly all the region east of the 100th meridian receives more rainfall at this season than during the winter months. This is an important fact in

determining the success of agriculture, because summer is the growing season for crops.

During the summer months the rainfall is particularly heavy along the southern Atlantic and Gulf coast. In parts of this region rain falls almost daily, and the climate is very similar to that of the wet season in Mexico. Along the northeastern coast the rain is evenly distributed through the year, so that there is little difference between the winter and summer rainfall.

The summer temperatures throughout the eastern states are high, temperatures of over a hundred degrees frequently being reached in the heat of the day in many places during July and August. Owing to the relatively high temperatures of the summer and to the abundant moisture, both of which are favorable to the growth of agricultural products, the eastern portion of the country is the most densely populated and is a most important agricultural area, particularly for raising cereals, cotton, and rice.

The Interior Region. The great interior region lying between the Mississippi River and the Cordilleran Highland has a wide range of temperature from season to season, but the changes are not generally so sudden as they are along the eastern coast. In January the average temperature of St. Louis is the same as that of New York, *i. e.*, 30° Fahrenheit (see Fig. 82); but in the summer the temperature of St. Louis is more than ten degrees higher on the average than that of New York. The average summer temperatures of the middle Atlantic coast

here extend as far north as southern Canada. (See Fig. 84.)

The winters are cold and dry, with strong winds blowing out from the cold regions of Canada. These cold north winds, or *northers*, are unimpeded by mountain ranges. In the spring months they often sweep suddenly southward, carrying unseasonable temperatures even into southern Texas, and doing great damage to vegetation.

The summers are fairly dry, with clear skies, thereby favoring the growth of cereals

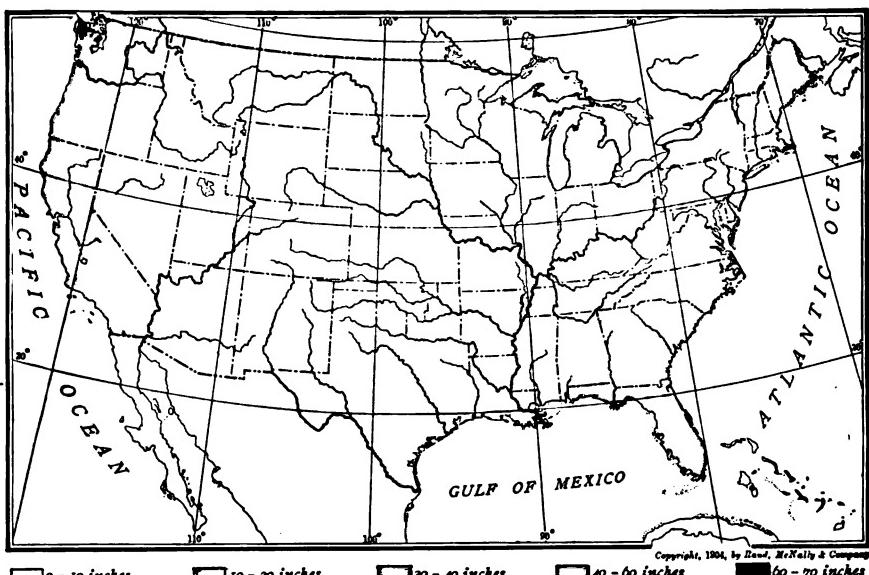


FIG. 188. A map showing the annual distribution of rainfall in the United States.

like wheat and corn, which require a rather high temperature with abundance of sunshine. To the westward the climate grows drier, so that west of about the 100th meridian agriculture is, as a rule, unsuccessful without irrigation. (See Fig. 190.)

The dryness of this region is due to two causes: to its distance from the ocean, so that it receives little moisture from the east and south winds; and also to the great Cordilleran Highland, which shuts it off from receiving much moisture from the Pacific. The great plains are therefore mostly a steppe area, in which grazing is the leading industry.





The West Coastal Region. The climate of the west coast of the United States, including the western slopes of the Cordilleran Highland, is unusually even. At low altitudes there is but little change of temperature from month to month. The average winter temperature of San Francisco is as high as that of Charleston, South Carolina (see Fig. 82), and the coastal portion even south of San Francisco has a summer temperature like that of Ontario, New York, and New England. (See Fig. 84.)

day after day, and the temperature rarely approaches the freezing point. As a result this region has become a favorite resort for people who cannot stand the rigor of the eastern winter.

The interior valleys and the plateaus lying between the bordering walls of the Rockies on the one side and the Sierra Nevada and Cascade mountains on the other are extremely dry. In fact, in certain parts of this region the rainfall is less than five inches a year. (See Fig. 188.) Most of this great area is therefore a desert or a steppe in which the population is sparse and scattered. Where irrigation is practiced towns and cities have grown up, but in Arizona, portions of New Mexico, southern Nevada, and eastern California extreme desert conditions prevail. The Mohave Desert, in southern California, is the driest region in the United States. (See Fig. 119.)

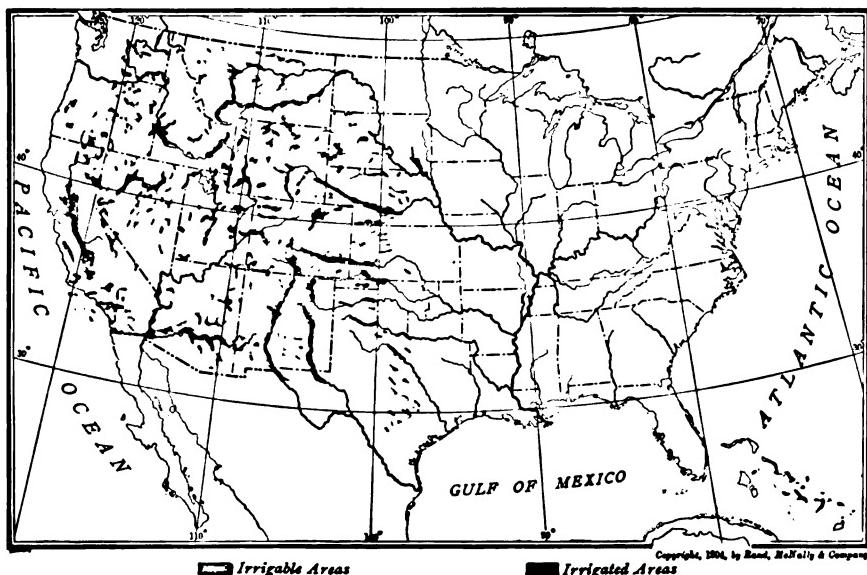


FIG. 190. Irrigated and irrigable lands in the United States.

Most of the rain throughout this region falls in winter, when the westerly wind area extends farthest south. In this season the rainfall of Washington, Oregon, and northern California is extremely heavy. (See Fig. 188.) The higher altitudes of this section have abundant moisture, and hence are clothed with heavy forests. But in summer even the mountain slopes are dry. Owing to the lack of summer rainfall, agriculture cannot be carried on in the larger part of this region except by means of irrigation.

The winter climate of southern California is delightful. Warm, fair weather prevails

the United States and its possessions. Write or print the names neatly. (2) On an outline map of the United States indicate its climatic regions; locate your home. (3) Locate on the map Boston, Charleston, Washington, New Orleans, St. Louis, St. Paul, Buffalo, Kansas City, Carson City, San Francisco, San Diego, Seattle. (4) Using two colors, draw arrows for the January and July winds of these towns. (5) Write their January and July temperatures and their average yearly rainfall. (6) Compare the climate of Boston and St. Paul, and of Washington and St. Louis, and account for the difference. (7) Write a similar comparison between the climate of San Francisco and Kansas City, or of San Francisco and Washington.

(8) Why has Omaha less rain than Memphis? San Francisco than Seattle? (9) Why is

Questions and Exercises

- (1) On an outline map of the world color in blue
- (2) On an outline map of the United States indicate its climatic regions; locate your home.
- (3) Locate on the map Boston, Charleston, Washington, New Orleans, St. Louis, St. Paul, Buffalo, Kansas City, Carson City, San Francisco, San Diego, Seattle.
- (4) Using two colors, draw arrows for the January and July winds of these towns.
- (5) Write their January and July temperatures and their average yearly rainfall.
- (6) Compare the climate of Boston and St. Paul, and of Washington and St. Louis, and account for the difference.
- (7) Write a similar comparison between the climate of San Francisco and Kansas City, or of San Francisco and Washington.
- (8) Why has Omaha less rain than Memphis? San Francisco than Seattle?
- (9) Why is

the rainfall of Vicksburg so heavy? (10) What portions of the United States are thinly peopled because of the aridity of the region? (11) Study the passage of a cyclone across the *Interior* and *East Coastal* divisions and account for the frequent winter thaws that occur there. (12) Account for a cold wave. (13) How would the presence of an east-west mountain range across these sections change the climate of the southern and southeastern states? (14) Compare the distribution of rainfall and population in the United States. (15) What similarity exists? (16) What influence has amount and distribution of rain had upon the density of population? (17) On the map used in Exercise 2 draw the one hundredth meridian. What is the chief industry to the east of this line? Why? (18) Locate the steppe area. (19) Locate two towns in this area. (20) Name and locate all the regions in the United States where the presence of a mountain barrier makes a difference in the rainfall of the two slopes.

(21) Which climatic division has an *oceanic* climate? (22) What are the characteristics of such a climate? (23) Why does the western coast have so cool a summer? (24) Draw a cross section of the windward and leeward slopes of the Sierra Nevada and show by colors the difference in the rainfall of these slopes; indicate also differences in vegetation. (25) Tell about the winter climate of southern California. (26) Locate the Mohave Desert and give reasons for aridity. (27) Which transcontinental routes pass through large desert areas?

(28) Write a composition about the climate of your home; tell how it affects your life.

XXV. THE UNITED STATES AS A WHOLE; PHYSICAL DIVISIONS

The United States contains several well-marked physical divisions, which vary greatly in their characteristics, and must be considered separately.

THE ATLANTIC AND GULF COASTAL PLAIN

Position. The Atlantic Coastal Plain is a broad, flat, low-lying plain beginning at New York and extending southward throughout the Atlantic Coastal and the Gulf states. It includes the whole of Florida and Louisiana, the larger portion of the state of Mississippi, and the alluvial plain of the Mississippi River south of the Ohio River. The Coastal Plain extends off shore in the great continental shelf. (See Fig. 173.)

Soil. The rocks forming the surface of the



FIG. 191. Physical divisions of the United States.

plain are weak and unconsolidated. The soil is everywhere deep and is generally fertile, but its fertility depends upon the character of the underlying rock from which it has been formed. In some of the states, as in North and South Carolina, broad strips of barren soils occur. These areas are covered with forests, while the other soils are for the most part devoted to agriculture. The coastal portion of this area, in the Southern States of the Atlantic Coast, is made up of marshes which are devoted to the cultivation of rice.

Surface and Drainage; Coast Line. The valleys are generally narrow, steep-sided, and shallow, because the plain rises so little





above the level of the sea that the rivers cannot cut into it deeply. Nearly all the larger streams are navigable for some distance, so that the products of the surrounding areas can be readily shipped. The most important water routes are the great *Mississippi* and the drowned valleys forming the *Chesapeake* and the *Delaware* estuaries.

From New York to South Carolina the shore is bordered by a series of barrier beaches, which form popular summer and winter resorts. These beaches are broken by few inlets, and consequently the harbors are far apart. The coast line of the southern states is also extremely regular and therefore has few good harbors.

Transportation; Climate. Owing to the gentle slopes and the extensive level uplands lying between the narrow river valleys, railroads can be built with ease in every direction. The network of railways that has grown

up, together with the navigable rivers, makes it easy to ship the products of this area to market. The climate, as we have already seen, is moist and warm. Therefore agriculture flourishes throughout this region. The earliest colony in the United States was founded in the coastal plain of Virginia.

The Alluvial Plain. The Alluvial Plain of the Mississippi is an extensive area of rich, black alluvial soil bordering the Mississippi below the Ohio. (See Fig. 47.) The river throughout its lower course runs in a channel above the surrounding country, and is kept in

bounds by levees. Every few years, however, the great river breaks through its bounding levees in the late spring and floods enormous areas, causing great damage to life and property. The soil and the climate of the southern portion of this alluvial plain of the Mississippi River are particularly favorable to the production of sugar cane and cotton, so that this part of the country is extremely important agriculturally.

THE PIEDMONT BELT

Surface. From New York to central Alabama the Coastal Plain is bordered on the west by a rolling region underlaid by strong rocks like those which form the Appalachian Mountains. The surface is varied, in places rugged. The rivers run in young or in mature valleys, in which the slopes are often steep, so that water power is abundant. (See Fig. 193.)

The Fall Line. Where the streams pass from the stronger rocks of the Piedmont Belt to



FIG. 193. *The falls at Paterson, New Jersey, which furnish power for the extensive silk mills.*

the more gentle slopes formed in the weaker rocks of the Coastal Plain a series of rapids or falls occurs. This boundary line is commonly spoken of as the Fall Line. As the Fall Line marks in general the head of navigation on the rivers, and as it furnishes splendid water power, it provides town sites with great natural advantages.

The products of the agricultural areas of the Piedmont Belt and Coastal Plain can readily be transported to the Fall Line towns for manufacturing or for shipment. Thus in many cases conditions favorable to agriculture,

manufacturing, and commerce are found near the same spot. Hence the most favorably situated Fall Line towns rapidly became large cities, among which may be mentioned *Trenton*, N. J., *Philadelphia*, Pa., *Baltimore*, Md., *Washington*, D. C., *Richmond* and *Petersburg*, Va., *Raleigh*, N. C., *Columbia*, S. C., *Augusta* and *Macon*, Ga., and *Montgomery*, Ala.

Agriculture; Transportation. Owing to the altitude, the climate of the Piedmont Belt is a little colder than that of the Coastal Plain, but is everywhere sufficiently warm and moist for agriculture. This occupation therefore prevails throughout the area. The higher slopes are covered with forests, and the rocks contain some mineral wealth.

The slopes are not so steep but that railroads can be built with ease. Two of the principal lines connecting the northern ports with the agricultural southern states pass through the Piedmont Belt or along the western border of the Coastal Plain.

THE APPALACHIAN HIGHLAND

The Appalachian Highland, which runs from the St. Lawrence River to central Alabama, includes the whole of New England and parts of all the other States of the Atlantic Coast, as well as portions of West Virginia, Kentucky, and Tennessee. This great highland area may be divided into three regions, the *Appalachian Mountains*, the *Great Valley*, and the *Plateaus*, in each of which the physical features vary strikingly from those in any other portion. (See Fig. 191.)

The Appalachian Mountains. The eastern part of the Appalachian Highland, known as the *Appalachian Mountains*, extends through the whole of New England and in a narrow belt from the Hudson River to Alabama. The highest peaks are in New Hampshire and in North Carolina. The Appalachian Mountains are made up of strong rocks; they increase in height and width to the southward. The slopes are steep and the topography generally rugged.

In the north where the rivers cross the highland in water gaps, the boundary between the States of the Atlantic Coast and of the interior was drawn west of the Appalachian Mountains.

Throughout the southern states, that is from central Virginia to Alabama, the mountains are so rugged and unbroken that they offer little opportunity for railroads, and thus have always been a barrier to trade and travel. The southern mountains form a divide between the rivers that flow into the Atlantic Ocean and the Gulf of Mexico, and



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FIG. 194. Lookout Mountain, Tennessee.

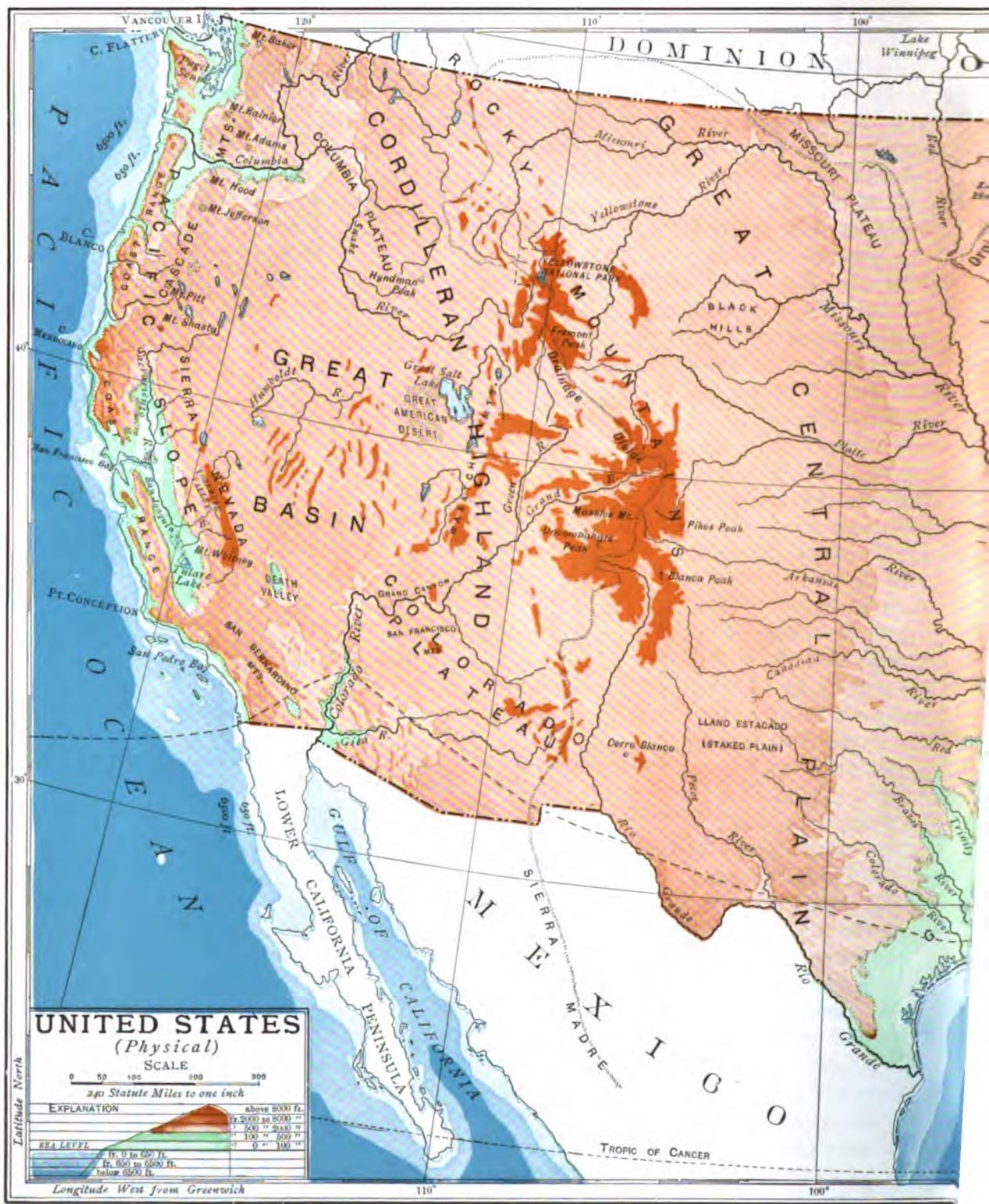
are the natural boundary between North Carolina and Tennessee. (See Fig. 194.)

Agriculture is possible only in the lowlands and on the more gentle slopes, so that the population is scattered, and large parts of the region are left in forest. Hardwood trees are found in the south and coniferous trees particularly in the north. The mountain rocks contain some valuable minerals, but they are not worked to any extent.

The Great Valley. Just west of the Appalachian Mountains is a long, narrow depression of weak rocks, known as the *Great Valley*. This region, extending from the St. Lawrence River to Alabama, is bounded by the steep slopes of the Appalachians on the east and by the eastern rim of the Allegheny

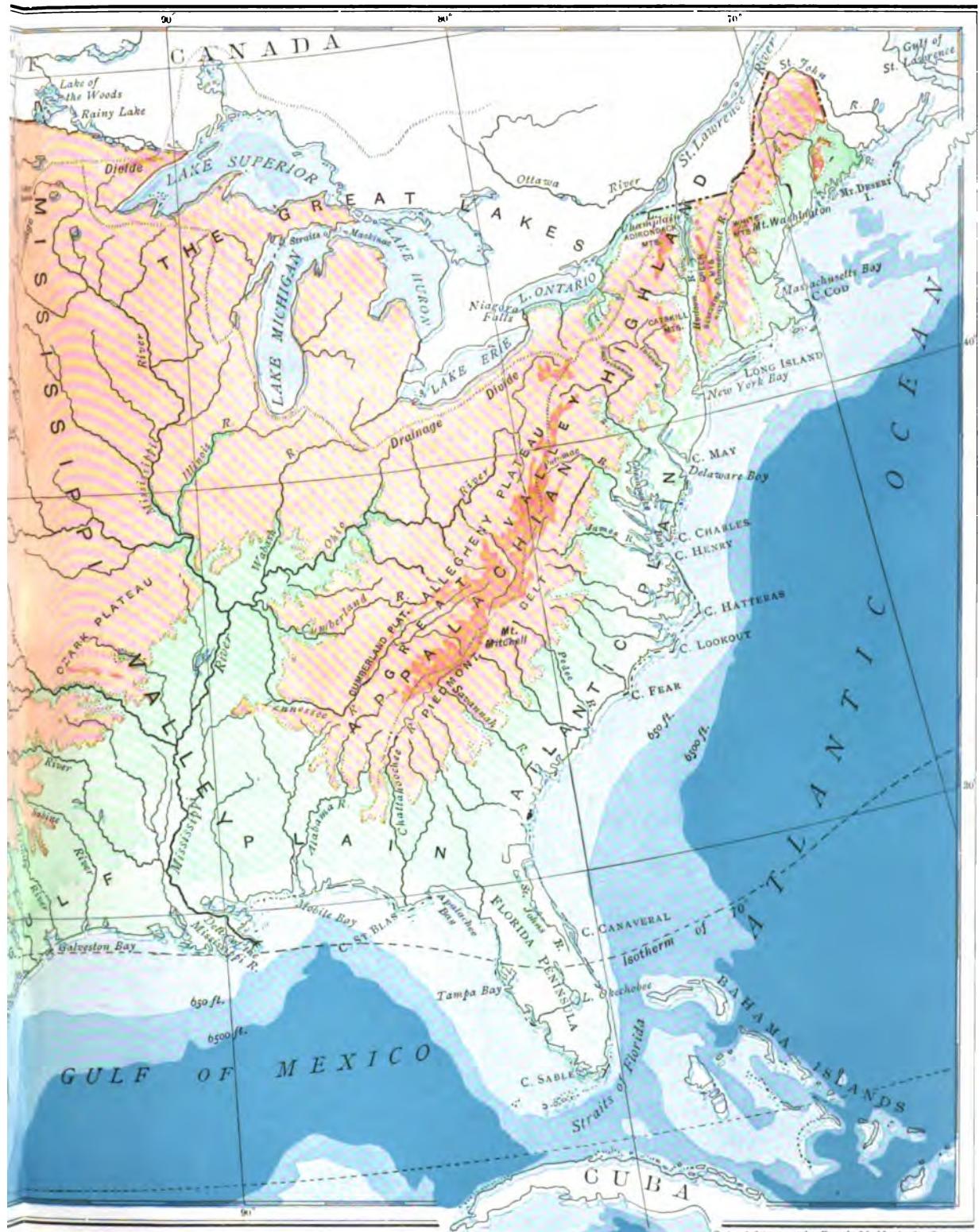






THE UNITED STATES AS A WHOLE

I



The West Coastal Region. The climate of the west coast of the United States, including the western slopes of the Cordilleran Highland, is unusually even. At low altitudes there is but little change of temperature from month to month. The average winter temperature of San Francisco is as high as that of Charleston, South Carolina (see Fig. 82), and the coastal portion even south of San Francisco has a summer temperature like that of Ontario, New York, and New England. (See Fig. 84.)

day after day, and the temperature rarely approaches the freezing point. As a result this region has become a favorite resort for people who cannot stand the rigor of the eastern winter.

The interior valleys and the plateaus lying between the bordering walls of the Rockies on the one side and the Sierra Nevada and Cascade mountains on the other are extremely dry. In fact, in certain parts of this region the rainfall is less than five inches a year. (See Fig. 188.) Most of this great area is therefore a desert or a steppe in which the population is sparse and scattered. Where irrigation is practiced towns and cities have grown up, but in Arizona, portions of New Mexico, southern Nevada, and eastern California extreme desert conditions prevail. The Mohave Desert, in southern California, is the driest region in the United States. (See Fig. 119.)

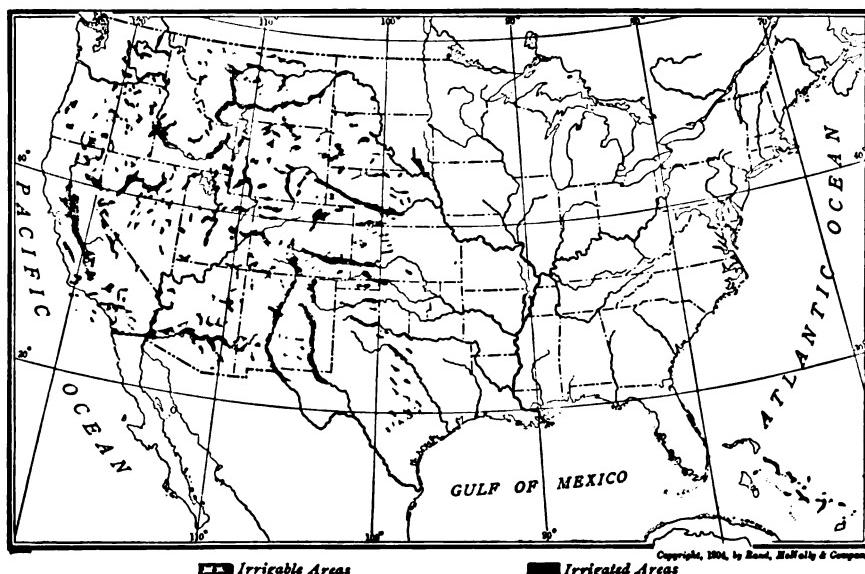


FIG. 190. *Irrigated and irrigable lands in the United States.*

Most of the rain throughout this region falls in winter, when the westerly wind area extends farthest south. In this season the rainfall of Washington, Oregon, and northern California is extremely heavy. (See Fig. 188.) The higher altitudes of this section have abundant moisture, and hence are clothed with heavy forests. But in summer even the mountain slopes are dry. Owing to the lack of summer rainfall, agriculture cannot be carried on in the larger part of this region except by means of irrigation.

The winter climate of southern California is delightful. Warm, fair weather prevails

the United States and its possessions. Write or print the names neatly. (2) On an outline map of the world color in blue

- (1) On an outline map of the world color in blue
- (2) On an outline map of the United States indicate its climatic regions; locate your home.
- (3) Locate on the map Boston, Charleston, Washington, New Orleans, St. Louis, St. Paul, Buffalo, Kansas City, Carson City, San Francisco, San Diego, Seattle.
- (4) Using two colors, draw arrows for the January and July winds of these towns.
- (5) Write their January and July temperatures and their average yearly rainfall.
- (6) Compare the climate of Boston and St. Paul, and of Washington and St. Louis, and account for the difference.
- (7) Write a similar comparison between the climate of San Francisco and Kansas City, or of San Francisco and Washington.
- (8) Why has Omaha less rain than Memphis? San Francisco than Seattle?
- (9) Why is

the rainfall of Vicksburg so heavy? (10) What portions of the United States are thinly peopled because of the aridity of the region? (11) Study the passage of a cyclone across the *Interior* and *East Coastal* divisions and account for the frequent winter thaws that occur there. (12) Account for a cold wave. (13) How would the presence of an east-west mountain range across these sections change the climate of the southern and southeastern states? (14) Compare the distribution of rainfall and population in the United States. (15) What similarity exists? (16) What influence has amount and distribution of rain had upon the density of population? (17) On the map used in Exercise 2 draw the one hundredth meridian. What is the chief industry to the east of this line? Why? (18) Locate the steppe area. (19) Locate two towns in this area. (20) Name and locate all the regions in the United States where the presence of a mountain barrier makes a difference in the rainfall of the two slopes.

(21) Which climatic division has an *oceanic* climate? (22) What are the characteristics of such a climate? (23) Why does the western coast have so cool a summer? (24) Draw a cross section of the windward and leeward slopes of the Sierra Nevada and show by colors the difference in the rainfall of these slopes; indicate also differences in vegetation. (25) Tell about the winter climate of southern California. (26) Locate the Mohave Desert and give reasons for aridity. (27) Which transcontinental routes pass through large desert areas?

(28) Write a composition about the climate of your home; tell how it affects your life.

XXV. THE UNITED STATES AS A WHOLE; PHYSICAL DIVISIONS

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Position. The Atlantic Coastal Plain is broad, flat, low-lying plain beginning at New York and extending southward through the Atlantic Coastal and the Gulf states. It includes the whole of Florida and Louisiana, the larger portion of the state of Mississippi, and the alluvial plain of the Mississippi River south of the Ohio River. The Coastal Plain extends off shore in the great continental shelf. (See Fig. 173.)

Soil. The rocks forming the surface of the



FIG. 191. Physical divisions of the United States.

plain are weak and unconsolidated. The soil is everywhere deep and is generally fertile but its fertility depends upon the character of the underlying rock from which it has been formed. In some of the states, as in North and South Carolina, broad strips of barrier soils occur. These areas are covered with forests, while the other soils are for the most part devoted to agriculture. The coastal portion of this area, in the Southern States of the Atlantic Coast, is made up of marshes which are devoted to the cultivation of rice.

Surface and Drainage; Coast Line. The valleys are generally narrow, steep-sided and shallow, because the plain rises so little

winds during the winter, while in the summer the Heat Equator extends as far north as Arizona. (See Figs. 82 and 84.) The larger part of the continent, therefore, lies in the region where the climatic differences between summer and winter are great. Owing to its size and position, North America has the most strongly marked continental climate in the world except Eurasia.

The Western Coast. The most uniform conditions of temperature and moisture are found along the western coast, where the winds blowing in from the Pacific bring the warmth and moisture acquired from the ocean. (See Fig. 97.) On the mountain slopes bordering the coast north of central California the annual rainfall is very heavy, in some places more than a hundred inches. (See Fig. 97.) In summer when the westerly wind system has moved north but little rain falls in this region even on the high mountain peaks, but in winter the mountains receive abundant rainfall as far south as southern California. The westerly slopes of the mountains in the rainy region, being well watered, are covered with magnificent forests. (See Fig. 119.) The eastern slopes and the interior valleys are drier and more barren.

The Great Central Plain. The great interior plain of North America is extremely cold in winter and hot in summer. The outblowing winds of winter are so dry that this region receives but little moisture at that season, except in the southern Mississippi Valley. In the summer growing season, however, when the winds blow inland, it is fairly well watered. The heaviest rainfall is in the eastern and southern portions. The warmest portion of the plains region in summer is along the lower Missouri River, and the center of the extreme continental cold in the winter is in Alberta. (See Figs. 82 and 84.)

The Eastern Coast. The eastern coast of North America has the most rapid changes in

weather of any portion of the continent. In winter when a storm center is occupying the interior, the northeast winds, passing over the cold Arctic Current, usually bring snow, while the southeasterly winds, coming from over the warmer North Atlantic Drift, bring rain. Inasmuch as the storms usually move from the southwest to the northeast, they follow a path nearly parallel to the Appalachian Mountains, and thus the rainfall is evenly distributed and one side of the highland is not dry and the other wet, as is the case in the Cordilleran Highland. The cold northwesterly winds of winter after the passage of a storm often cause extremely low temperatures, so that once in every seven or eight years killing frosts may extend even into southern Florida.

The Gulf Coast. Along the Gulf Coast, especially west of the Mississippi River, there are well-marked monsoon winds with the change of season from winter to summer. The summer winds blowing in toward the Mississippi Valley come from the warm waters of the Gulf of Mexico and carry an abundance of moisture, a large part of which falls as heavy rain near the coast. (See Fig. 97.) As a result the region about New Orleans has the heaviest rainfall found in the United States, with the exception of that in Washington and Oregon. (See Fig. 97.)

The western part of Texas, which is out of the range of the Gulf winds, is very dry.

In Mexico and Central America, where the prevailing climate is that of the trade-wind region, the east coast is wet and the west coast dry, although in no case a desert. As the winds rise in passing over the eastern slopes they lose the larger part of their moisture, so that the high plateaus in northern Mexico are exceedingly dry.

Vegetation. Northern North America, including the island region of Arctic America as far south as the coast of Hudson Bay, and the coast of Labrador, is covered by

XXVII. NEW ENGLAND

STATE	Abbreviation	Area in sq. miles	Population 1900	Chief City	Population 1900	Capital
Maine.....	Me.....	33,040	694,466	Portland.....	50,145	Augusta
New Hampshire.....	N. H.....	9,305	411,588	Manchester....	56,987	Concord
Vermont.....	Vt.....	9,565	343,641	Burlington....	18,640	Montpelier
Massachusetts.....	Mass....	8,315	2,805,346	Boston.....	560,892	Boston
Rhode Island.....	R. I.....	1,250	428,556	Providence....	175,597	Providence
Connecticut.....	Conn...	4,990	908,420	New Haven...	108,027	Hartford

The six states which make up New England are together about one-fourth the size of Texas, and have a population of a little over five and a half millions. This is not much more than the combined population of New York and Chicago, the two largest cities in the United States. The population of New England is centered largely about the cities in Massachusetts, Rhode Island, and Connecticut. Rhode Island and Massachusetts are the most densely populated states in the Union.

Surface. New England is almost entirely made up of strong rocks like those forming the Appalachian Mountains. It has a diversified surface, but along the coast it is generally low, especially in the three southern states. Farther from the ocean the altitude is greater, so that a large part of New England is an upland. This upland was once a peneplain; that is, it was worn down by the action of the atmosphere and the rivers almost to the level of the sea. Later it was

elevated to its present position, and the lowland became an upland. Into this upland the streams have cut narrow valleys, deeper in their upper courses than near the sea, because of the increased altitude farther from the coast. From the hilltops the even peneplain surface may be seen extending in every direction, while occasional isolated peaks or groups of peaks rise above it as monadnocks. **Monadnock Mountain**, Mount Greylock, the White Mountains, and many other peaks are excellent illustrations of such monadnocks. (See Fig. 203.) From the valleys these peaks seem majestic and lofty, but from the upland they appear only as slight elevations above the general level.

The strong rock ridges of New England are more or less parallel to one another and run in a general northeast-southwest direction, being parallel to the general trend of the Appalachians, with which they are connected. Hence the lowlands which have been worn into the weaker rocks are also



FIG. 203. *In the region of the White Mountains.*

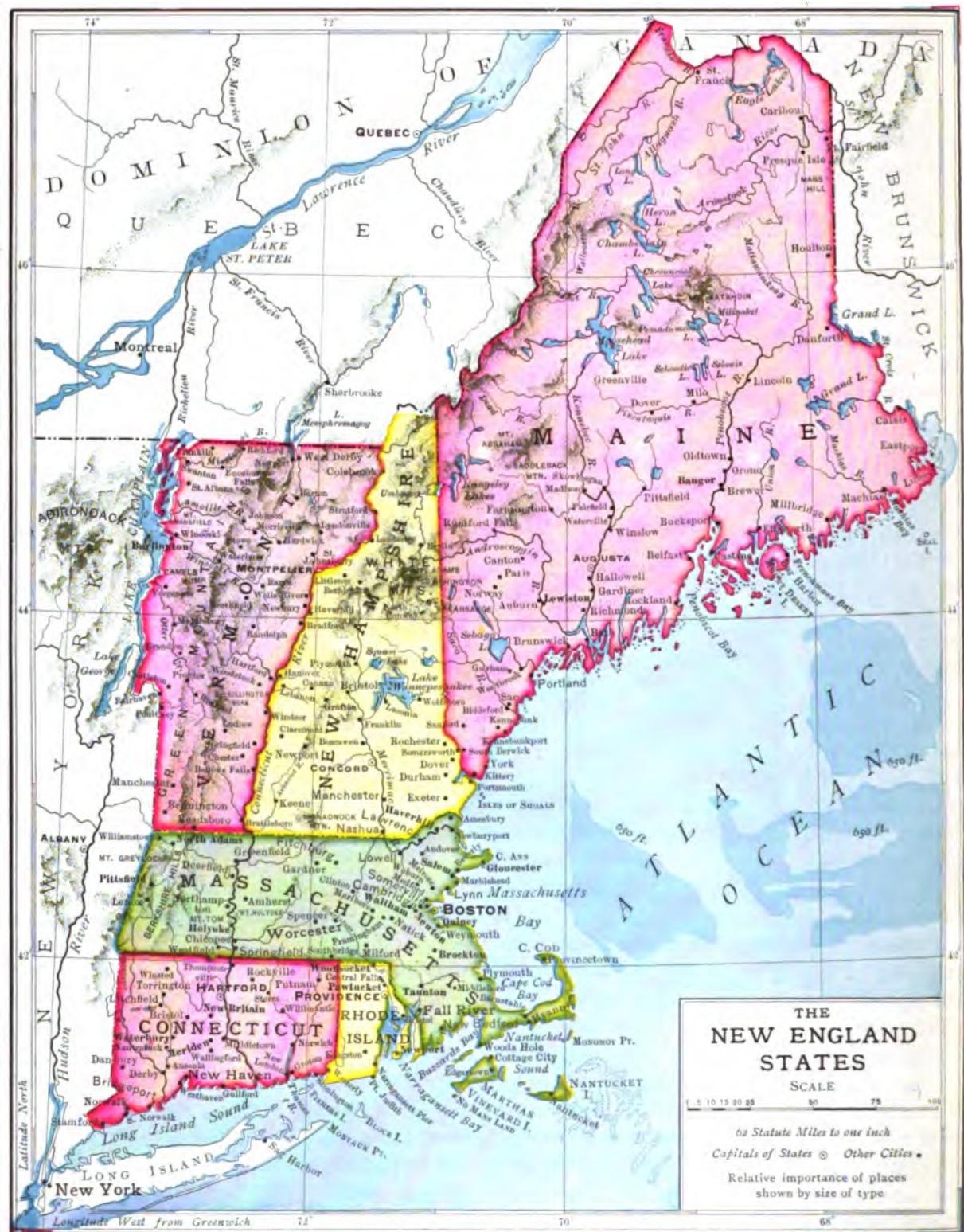


FIG. 204.

parallel. This is well illustrated along the coast of Maine where the mountain ridges have been drowned. The coast line is extremely irregular and consists of a series of narrow inlets with low ridges between. The numerous small harbors afford protection to fishermen, while the narrow ridges furnish land for homes and small farms. The offshore islands are the partially-drowned outer peaks of the mountain ridges which form the peninsulas.

Soils. The whole of New England, even to the very tops of the higher mountains, was covered by the glacier which once spread over northern North America. (See Fig. 180.) The soils which formerly existed on the upland were largely removed and deposited irregularly in the lowland valleys. Since the melting of the ice sheet there has not been sufficient time for deep soils to form again on the uplands. For this reason these regions are unfavorable for agriculture, sparsely populated, and largely given up to forests or pastures. The uplands in the northern states contain many farms which have been abandoned because agriculture has failed. These farms are now being bought up as summer residences by people from the large cities, or by those who desire to devote their attention to grazing and poultry raising rather than to agriculture. The soils in the river valleys are deep and generally rich, and devoted principally to agriculture.

Along the southern and southeastern shore, particularly in Massachusetts and Rhode Island, the glacier deposited great areas of sand, so that these regions are not so fertile as the river valleys.

The glacial soils are naturally fertile when they are not sandy. They cannot always be profitably used for agriculture, however, because of the large boulders of strong rock which were plucked from the highlands and scattered so thickly over the surface as to make it difficult to till the ground. (See

Fig. 206.) In certain regions these boulders have been made into stone fences or built into house walls. There are still enough of them just under-ground, however, to make it difficult to plow or harrow.

Drainage. The rivers of New England are short and navigable for only a few miles inland. Hence they have never been of great importance in commerce, except in their lower portions. The early explorers who followed the lines of the larger rivers in the hope of finding a highway to the fur-producing regions, soon discovered that these rivers gave them no access to that country. Hence their headwaters were not explored thoroughly, and no forts or trading stores were established here as along the larger rivers farther west.

At the head of navigation on the several large rivers cities have grown up. The most important of these are *Hartford* and *Norwich*, Conn., *Haverhill*, Mass., and *Lewiston*, *Augusta*, and *Bangor*, Me. The last three towns have depended largely for their growth upon the fact that the rivers on which they are situated flow through the lumbering country. They have long been the natural outlets for lumber.

The rivers of New England derive their importance from their value in manufacturing. The great glacier deposited its detritus irregularly in the valleys so that many natural dams were formed, at which the rivers now have falls. These falls furnish excellent water power, and the larger ones were early the centers about which towns sprang up. Although the water power is not sufficient for all the manufacturing and is supplemented in most of the large centers by steam power, yet about one-third of the manufacturing in this group of states is still done by water power. It is natural therefore to find many important manufacturing towns located on the rivers. *Biddeford*, Me., *Haverhill*, *Lawrence*, and

XXIV. THE UNITED STATES AS A WHOLE

Size and Extent. The United States, not including Alaska and the many dependencies, has an area of 3,025,600 square miles; that is, it is a little larger than the continent of Australia. Including Alaska, the Philippines, Hawaii, Porto Rico, and a few scattered islands in the Pacific Ocean, the area is 3,728,000 square miles, or nearly equal to that of all Europe. The United States

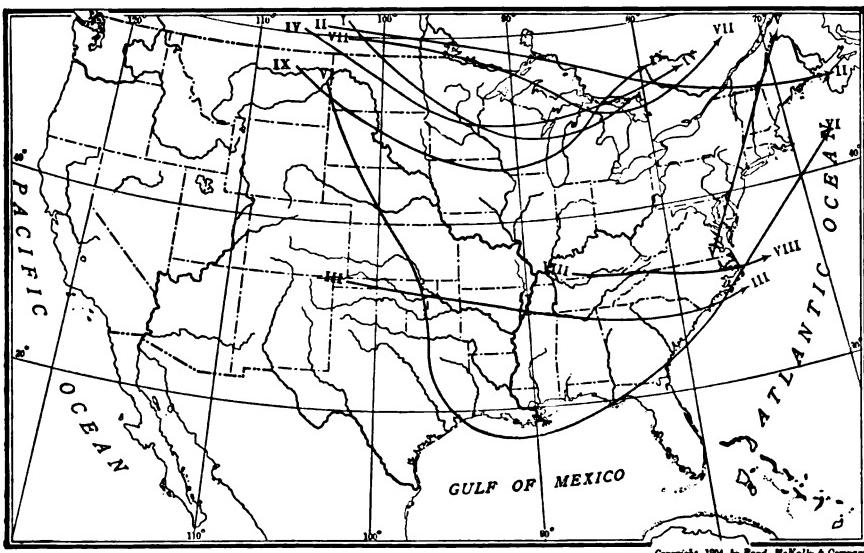


FIG. 187. *Storm tracks of the United States, showing the direction in which the areas of low pressure move across the country.*

extends from the Atlantic to the Pacific, and from the Great Lakes to the Gulf of Mexico. It therefore includes parts of all the great physical divisions of North America and has an extremely varied climate.

The crops that are raised in the different regions, the occupations that the people follow, and the distribution of the population depend very closely on the surface features and on the climate. Consequently we need to know something about the surface and the climate of the different sections of the country before we study the detailed geographic conditions in the several groups of states.

CLIMATE

The Climatic Regions. There are three great climatic regions in the United States: the *East Coastal* and *Gulf*, the *Interior*, and the *West Coastal*. Three similar divisions are found in Canada, but the climatic features there differ somewhat from those in our own country, owing to the fact that the United States is situated farther south, and therefore is, in general, warmer than Canada.

The East Coastal Region. The East Coastal and Gulf region includes all the area east of the Mississippi River. It is characterized by cold winters, warm summers, and an abundance of rain through the year.

In winter, storms and clear weather follow one another across the continent in rapid succession and bring sudden and severe changes of weather to the eastern states. (See Fig. 187.) A change of temperature of fifty degrees or more may occur in twenty-four hours. As a result the ground is

sometimes so thawed in winter that vegetation may start, only to be frozen again in a few days. It is for this reason that the fruit along the Atlantic coast is frequently damaged so that the crops are small. The inblowing stormwinds carry moisture from the ocean which falls largely as snow in the northern portion and as rain in the southern.

In summer, along the whole Atlantic and Gulf coast, the prevailing winds blow from the ocean; they therefore carry moisture to the continent, so that nearly all the region east of the 100th meridian receives more rainfall at this season than during the winter months. This is an important fact in

determining the success of agriculture, because summer is the growing season for crops.

During the summer months the rainfall is particularly heavy along the southern Atlantic and Gulf coast. In parts of this region rain falls almost daily, and the climate is very similar to that of the wet season in Mexico. Along the northeastern coast the rain is evenly distributed through the year, so that there is little difference between the winter and summer rainfall.

The summer temperatures throughout the eastern states are high, temperatures of over a hundred degrees frequently being reached in the heat of the day in many places during July and August. Owing to the relatively high temperatures of the summer and to the abundant moisture, both of which are favorable to the growth of agricultural products, the eastern portion of the country is the most densely populated and is a most important agricultural area, particularly for raising cereals, cotton, and rice.

The Interior Region. The great interior region lying between the Mississippi River and the Cordilleran Highland has a wide range of temperature from season to season, but the changes are not generally so sudden as they are along the eastern coast. In January the average temperature of St. Louis is the same as that of New York, *i.e.*, 30° Fahrenheit (see Fig. 82); but in the summer the temperature of St. Louis is more than ten degrees higher on the average than that of New York. The average summer temperatures of the middle Atlantic coast

here extend as far north as southern Canada. (See Fig. 84.)

The winters are cold and dry, with strong winds blowing out from the cold regions of Canada. These cold north winds, or *northers*, are unimpeded by mountain ranges. In the spring months they often sweep suddenly southward, carrying unseasonable temperatures even into southern Texas, and doing great damage to vegetation.

The summers are fairly dry, with clear skies, thereby favoring the growth of cereals

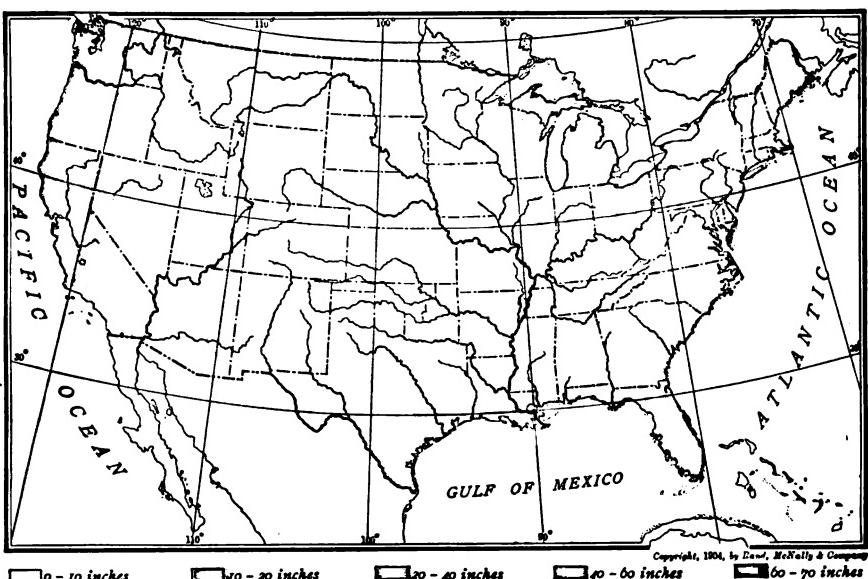


FIG. 188. A map showing the annual distribution of rainfall in the United States.

like wheat and corn, which require a rather high temperature with abundance of sunshine. To the westward the climate grows drier, so that west of about the 100th meridian agriculture is, as a rule, unsuccessful without irrigation. (See Fig. 190.)

The dryness of this region is due to two causes: to its distance from the ocean, so that it receives little moisture from the east and south winds; and also to the great Cordilleran Highland, which shuts it off from receiving much moisture from the Pacific. The great plains are therefore mostly a steppe area, in which grazing is the leading industry.



The other form of fishing is that which is carried on near shore, particularly for mackerel, herring, and bluefish. These fish are caught mainly in the summer months by fishermen from the small ports, who get their catch to market as soon as possible. Along the shore in some places, clams, which live on the bottom, are dug and sent to the city markets. South of the peninsula of Cape Cod, oyster raising is an important occupation, some of the best oysters coming from the shores of Rhode Island and Connecticut.

In the estuaries of this southern shore, scallops are caught for the winter market. Lobsters are also a valuable fish product along the coast of Maine and Massachusetts. So much fish is canned along the coast of Maine that this state ranks next to Washington, the most important fish-canning state in the Union.

Although fishing is still a leading occupation in the New England States, it is by no means as important as it was in the early history of the country when whale oil was the principal fluid used for artificial lighting, and when whaling employed a large number of vessels. At that time *New Bedford*, *Nantucket*, and *Marblehead*, Mass., were, because of their fishing, among the largest cities in the Union.

Mining and Quarrying. The strong rocks, which make the surface of New England, contain few mineral deposits of value, but they are exceedingly important for furnishing building and ornamental stones. Granite is quarried extensively in the northern states for building and paving stones. *Concord*,

N. H., *Barre*, *Vt.*, *Rockland*, *Me.*, *Quincy* and *Glooucester*, *Mass.*, and *Westerly*, *R. I.*, are the chief granite-producing centers. The importance of the industry in all these towns, except Barre, *Vt.*, is in part dependent upon the fact that they lie close to the sea, so that the quarry products may be easily and cheaply shipped. The quarrying of marble is carried on extensively in *Vermont*; *Rutland* is the chief center for this industry in the United States. *Vermont* also produces a large amount of slate. In the

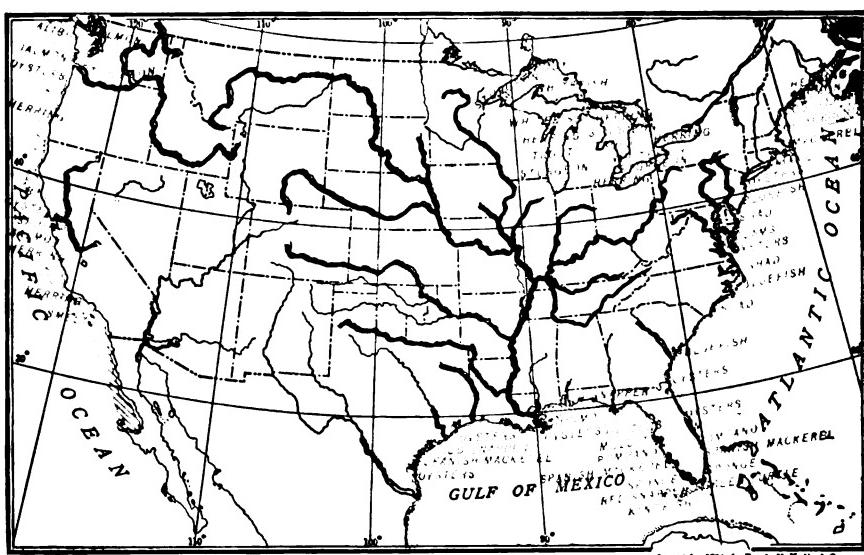


FIG. 209. *The principal fisheries of the coastal, lake, and interior waters.*

lower Connecticut Valley sandstones, which have been much used as ornamental building stones, are quarried, and the volcanic ridges near the sandstone areas are increasing in importance as sources of supply for excellent road-building material.

Manufacturing. Although more than one-half of the people in New England are engaged in manufacturing, New England produces less than fifteen per cent of the manufactured products of the United States. It is surpassed in this particular by the Middle States of the Atlantic Coast and the Northern States of the Mississippi Basin. Each of these groups of states produces manufactured

products twice as valuable as those of New England. (See Fig. 231.)

The manufacturing establishments of New England are largely in the valleys and near the ocean, where the supply of power and the opportunities for commerce make the

is centered largely in the three cities, *Brockton*, *Lynn*, and *Haverhill*, Mass.

Massachusetts is the first cotton-manufacturing state in the Union. (See Fig. 211.) It imports the raw cotton mostly from the southern states. *Fall River*, Mass., is the most important cotton-manufacturing city in the United States. *Lowell*, *New Bedford*, and *Lawrence*, Mass., and *Manchester*, N. H., are also centers for this industry.

Massachusetts is also the first state in the manufacture of woolens and woolen goods. (See (Figs. 212 and 213). Lowell, next to Philadelphia, is the leading woolen manufacturing city in the country. *Lawrence*, *Lowell*, and *Fitchburg*, Mass., and other smaller towns

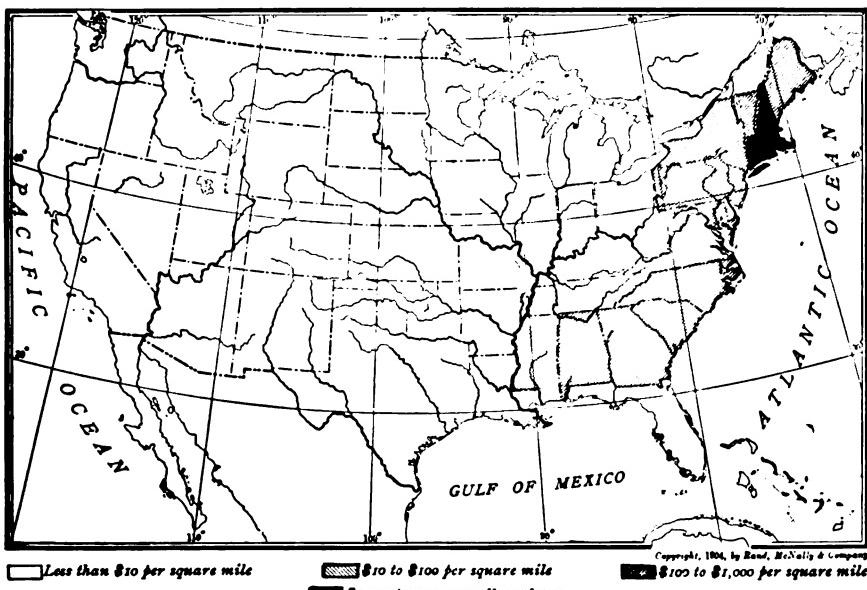


FIG. 210. The leading cotton-manufacturing areas of the United States.

industry most successful. Most of the raw products necessary for manufacturing have to be brought from a distance, but the advantages of cheap power and good transportation facilities so far outweigh this one disadvantage that manufacturing is constantly increasing. Because of the development of manufacturing the people have migrated in large numbers from the country regions to the towns, so that in large portions of New England, especially in the northern part, the rural population has greatly decreased in recent years.

The most important manufactures are cotton and woolen goods, leather products, machinery for cotton and woolen mills, fine tools, and delicate instruments. Massachusetts leads in the manufacture of boots and shoes, making nearly half the boots and shoes of the United States. This industry

turn out so large a product of woolens and textiles that the value of these goods in Massachusetts exceeds that of Pennsylvania, the second state in the value of woolen manufactures, by many millions of dollars annually.

Rhode Island is the leading state in the

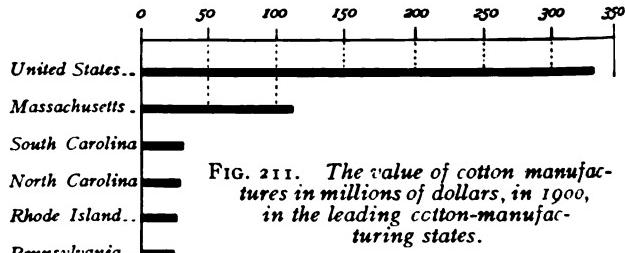


FIG. 211. The value of cotton manufactures in millions of dollars, in 1900, in the leading cotton-manufacturing states.

production of jewelry. This industry centers in *Providence*, which produces more than a quarter of the jewelry of the whole country. The neighboring cities of *Attleboro* and *North Attleboro*, Mass., are also important for their jewelry. Many of the towns of Connecticut,

like Meriden and Waterbury, lead in the production of plated silverware and brass work, and Waltham, Mass., is noted the world over for its fine watches.

Massachusetts is the second and Maine the third state in the Union in the production of paper. The paper mills are largely situated upon the headwaters of streams, like the Connecticut, the Androscoggin, and the Kennebec, where the abundance of water power and the nearness of the forests make this industry particularly successful. The largest paper-making city, however, is Holyoke, Mass., where the abundant water power of the Connecticut River is utilized for this purpose.

The finer grades of paper are made here, largely from rags rather than wood pulp.

Trade and Cities. Owing to the large and commodious harbors possessed by all the states of New England except Vermont, foreign and coastwise commerce is easily

connections with the large cities of Canada. It receives from Canada a great quantity of products for exportation during the winter months when the St. Lawrence is frozen. It also is the natural outlet for the manufactures of Biddeford, Saco, Lewiston, and

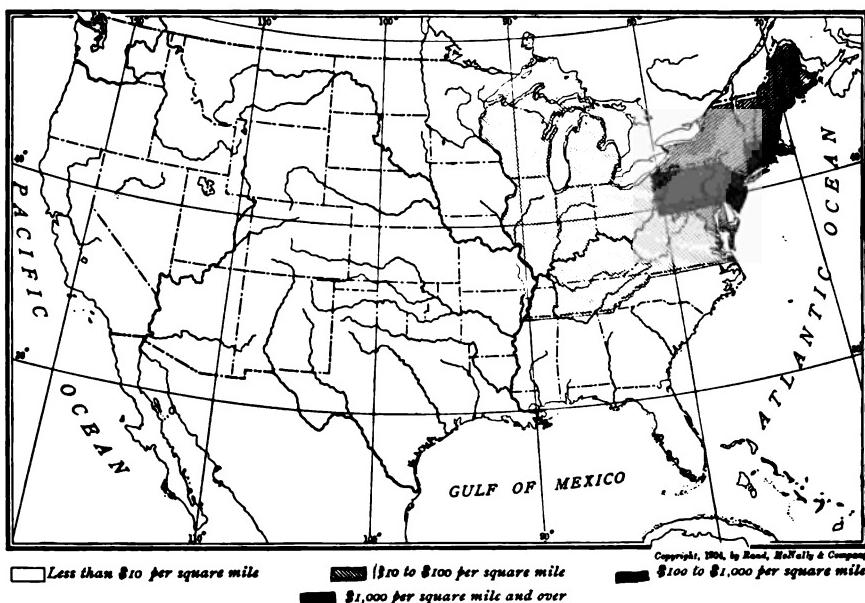


FIG. 212. The leading woolen-manufacturing areas of the United States.

the other neighboring manufacturing cities.

Southern New England is covered by a close network of railroads connecting the manufacturing cities with the ports. The railroads carry an enormous amount of freight to the ports, and also bring large quantities of food and raw products from the South and the West.

Boston, the principal wool market of the country, exports food products to Europe, and has an extensive coastwise commerce with New York, Savannah, and the West Indies. It is the financial center of New England, and the first city in the Union

for the exportation of leather and leather goods. It is situated on a fine harbor (see Fig. 214) and is surrounded by many cities, more than twenty of which are within an hour's ride by rail. The neighboring cities are nearly all important in some line of

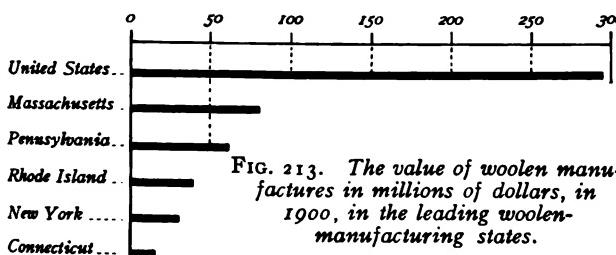


FIG. 213. The value of woolen manufactures in millions of dollars, in 1900, in the leading woolen-manufacturing states.

carried on and is very important. The chief commercial city is Boston, Mass., which ranks next to New York, the most important port in the United States. Portland, Me., is also a large and growing port because it possesses a fine harbor and has excellent railroad con-



XXIX. MIDDLE STATES OF THE ATLANTIC COAST

STATE	Abbreviation	Area in sq. miles	Population 1900	Chief City	Population 1900	Capital
New York.....	N. Y....	49,170	7,268,894	New York.....	3,437,202	Albany
Pennsylvania.....	Pa.....	45,215	6,302,115	Philadelphia..	1,293,697	Harrisburg
New Jersey.....	N. J....	7,815	1,883,669	Newark.....	246,070	Trenton
Delaware.....	Del....	2,050	184,735	Wilmington....	76,508	Dover
Maryland.....	Md....	12,210	1,188,044	Baltimore....	508,957	Annapolis
Virginia.....	Va....	42,450	1,854,184	Richmond....	85,050	Richmond
District of Columbia.....	D. C....	70	278,718	Washington....	278,718	

Size and Soil. The Middle States of the Atlantic Coast, extending from Canada on the north to North Carolina on the south, have together an area about twice that of New England. This group of states includes parts of the Atlantic Coastal Plain, the Piedmont Belt, and the several divisions of the Appalachian Highland, which have already been described. (See Fig. 191.) Nearly the whole of New York, and the northern portions of Pennsylvania and New Jersey, were covered by the continental glacier. (See Fig. 180.) Hence the streams abound in falls, lakes are numerous, and the upland soils are thin. In the valleys the glacial soils are deep and generally fertile. (See Fig. 197.) In the region which was not glaciated, soils like the underlying rock are found, as they are throughout the southern states.

Climate. Owing to the location of the Middle States of the Atlantic Coast on the easterly side of the continent, the climate is very changeable, but is everywhere moist. There is a wide range of temperature between the summer and the winter, and in winter the changes are rapid and often severe. In the higher Adirondacks the temperature is far below the freezing point during the larger part of the winter, while in southern Virginia extremely low temperatures are rarely recorded for more than two or three days at a time.

The summer climate is generally warm and moist. In the higher mountains like

the Adirondacks, the mountains of Pennsylvania, of eastern New York, and of western Virginia and Maryland cooler temperatures prevail at night. These regions have therefore become favorite summer resorts.

About New York City and in the lowland which lies to the east of Lake Erie, fogs are very dense during a large part of the winter months. In western New York the fogs are due to the condensation of the moisture brought by the warm air from the lakes to the cooler surface of the land. The fogs around New York City are formed by the chilling of the moisture brought from the sea. These fogs are often so dense as to interfere seriously with navigation. There are occasional days when no vessels can enter or leave New York Harbor on account of the fog.

THE COASTAL PLAIN

The coastal plain extends from New York southward and as far inland as the Fall Line. (See Fig. 191.)

Agriculture. The fine, rich soils, the early spring and late autumn, the abundant water supply brought down by the rivers, all favor the development of agriculture in the coastal plain. The network of railways connecting the interior with the great cities along the coast afford quick transportation. These cities, together with the manufacturing towns that have grown up along the Fall Line, furnish a ready market for everything that is raised. Therefore throughout this region

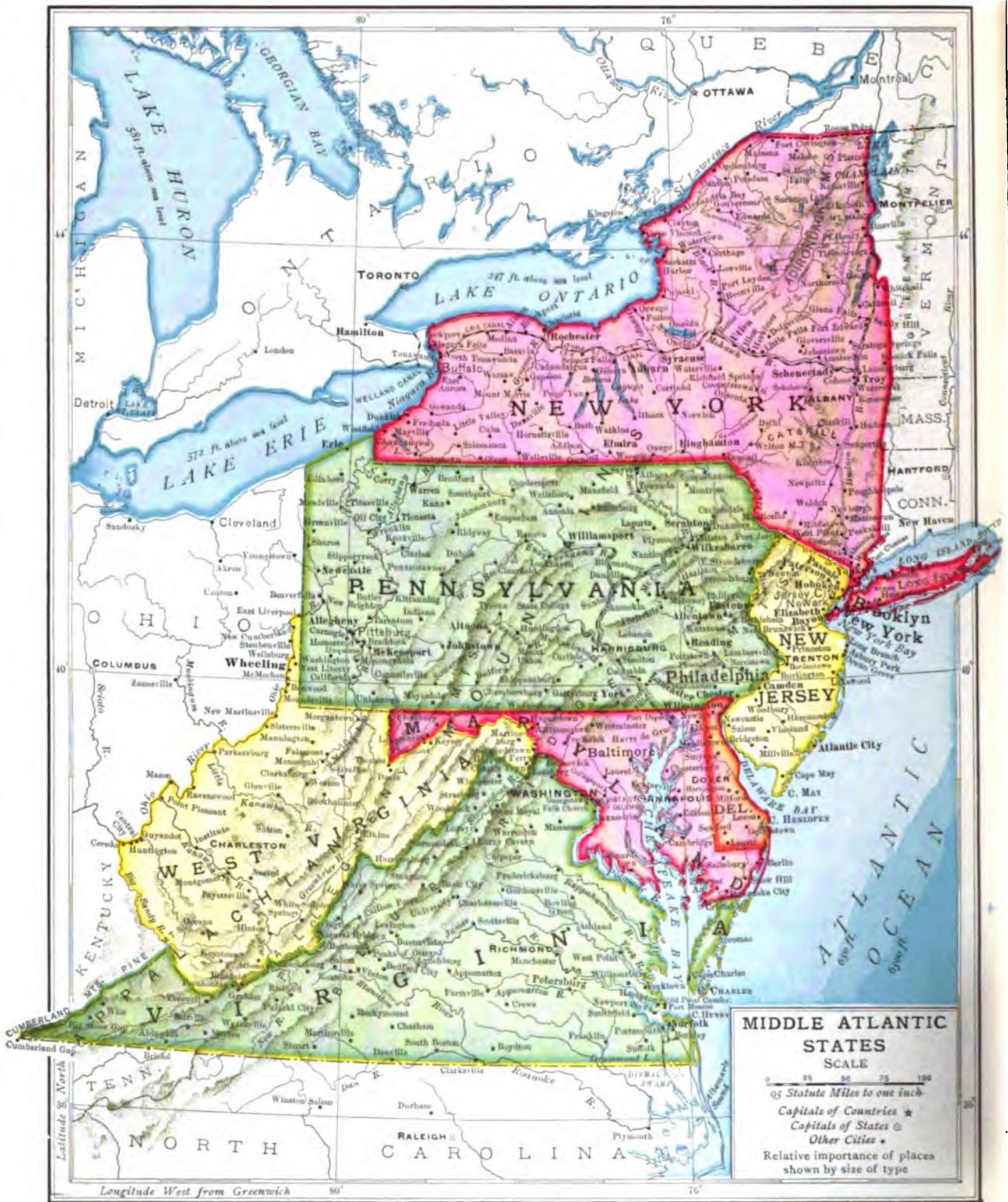


FIG. 215.

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early spring vegetables and potatoes, tomatoes and beans, fruits, such as grapes, peaches, strawberries, and cantaloupes, are grown in large quantities, and are either shipped by rail or by water to New York and the other large northern markets. Peanuts are raised in large portions of the coastal plain of Virginia, which leads all the states in the Union in this branch of agriculture. (See Fig. 216.)

Fishing. The rivers and estuaries of the coastal plain area are not only important as routes for commerce, but also for their fishing, particularly oyster fishing. (See Fig. 209.) Oysters require clear, warm, shallow water into which a steady supply of fresh water is running all the time so as to make it brackish. These conditions are all furnished in *Chesapeake Bay*, which receives the drainage of many large river basins. Hence this bay is the great center for oyster fishing, and *Baltimore*, Md., is the chief city in the country for the canning of oysters.

Mineral Products. The rocks of the coastal plain are valuable. Some of the clays are particularly adapted to the making of pottery, drain pipes, and light-colored bricks. *Trenton*, N. J., close to abundant supplies of pottery clay, is the most important pottery-making city in the Union, but secures its finer clays from a distance. *Perth Amboy*, N. J., at the northern extremity of the coastal plain, makes light-colored bricks, largely used for ornamental purposes in buildings. (See Fig. 217.) Certain rock layers of the coastal



FIG. 217. Towing *Perth Amboy* bricks into New York Harbor.

plain also supply glass sands for the making of glass.

THE PIEDMONT BELT

Beginning at the Fall Line, which forms the western boundary of the Atlantic Coastal Plain, and extending to the Allegheny Mountains, is the Piedmont Belt. (See Fig. 191.)

Agriculture. The Piedmont Belt, with its rolling surface and fine lowland soils, is, next to the coastal plain, the great agricultural portion of the Middle States of the Atlantic Coast. All parts of this belt have excellent railroad connections with the large cities, and therefore the agricultural products may be readily carried to market. (See Fig. 218.)

In the northern portion of the belt, particularly in New Jersey, most of the farmers are engaged in truck farming, that is, the raising of vegetables and fruit for immediate use in the neighboring cities. In Virginia the Piedmont Belt is the tobacco-growing area. *Lynchburg* and *Danville* are in the midst of the tobacco-producing country; *Richmond* is the second largest tobacco market in the United States.

Cities. The Piedmont Belt in New Jersey, being separated from New York City only by



FIG. 216. Peanut raising in Virginia.

XXIV. THE UNITED STATES AS A WHOLE

Size and Extent. The United States, not including Alaska and the many dependencies, has an area of 3,025,600 square miles; that is, it is a little larger than the continent of Australia. Including Alaska, the Philippines, Hawaii, Porto Rico, and a few scattered islands in the Pacific Ocean, the area is 3,728,000 square miles, or nearly equal to that of all Europe. The United States

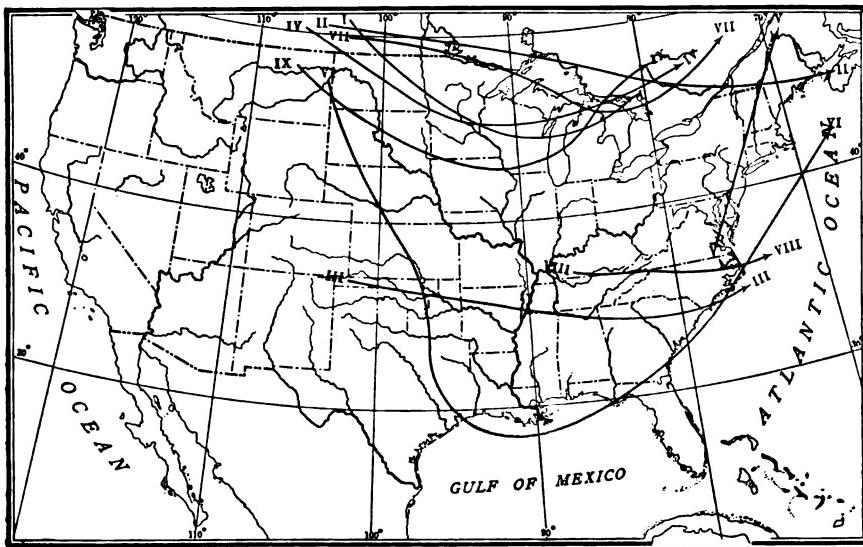


FIG. 187. *Storm tracks of the United States, showing the direction in which the areas of low pressure move across the country.*

extends from the Atlantic to the Pacific, and from the Great Lakes to the Gulf of Mexico. It therefore includes parts of all the great physical divisions of North America and has an extremely varied climate.

The crops that are raised in the different regions, the occupations that the people follow, and the distribution of the population depend very closely on the surface features and on the climate. Consequently we need to know something about the surface and the climate of the different sections of the country before we study the detailed geographic conditions in the several groups of states.

CLIMATE

The Climatic Regions. There are three great climatic regions in the United States: the *East Coastal* and *Gulf*, the *Interior*, and the *West Coastal*. Three similar divisions are found in Canada, but the climatic features there differ somewhat from those in our own country, owing to the fact that the United States is situated farther south, and therefore is, in general, warmer than Canada.

The East Coastal Region. The East Coastal and Gulf region includes all the area east of the Mississippi River. It is characterized by cold winters, warm summers, and an abundance of rain through the year.

In winter, storms and clear weather follow one another across the continent in rapid succession and bring sudden and severe changes of weather to the eastern states. (See Fig. 187.) A change of temperature of fifty degrees or more may occur in twenty-four hours. As a result the ground is

sometimes so thawed in winter that vegetation may start, only to be frozen again in a few days. It is for this reason that the fruit along the Atlantic coast is frequently damaged so that the crops are small. The inblowing stormwinds carry moisture from the ocean which falls largely as snow in the northern portion and as rain in the southern.

In summer, along the whole Atlantic and Gulf coast, the prevailing winds blow from the ocean; they therefore carry moisture to the continent, so that nearly all the region east of the 100th meridian receives more rainfall at this season than during the winter months. This is an important fact in



FIG. 220. *The Erie Canal at Syracuse.*

highway, with gentle grades connecting the Hudson Valley and the Great Lakes and making it possible to transport goods by this route from Buffalo and the West to New York with ease. Hence the Hudson Valley may well be called the Gateway of the American Continent. The water gap through the highlands of the Hudson is the narrowest and most important portion of this gateway. Through it pass two railroads, one on each side of the river. In the summer season the Hudson River is also an important route for water commerce. No one of the other rivers crossing the Appalachian Mountains is a water route, save for short distances where canals have been built.

The Susquehanna Valley. The Susquehanna Valley is the route of the second great railroad from Philadelphia and New York westward. This road, however, had to be built over high altitudes and is therefore more expensive to operate than the railroads which follow the Hudson River Valley.

THE GREAT VALLEY

The Great Valley is a trough lying just west of the Appalachian Mountains. It is not so broad or so well defined in New York as it is in the states farther south.

The Great Valley in New York. In New York the Great Valley is mainly of importance as a route of travel and transportation, inasmuch as it is narrow and contains the upper Hudson and Lake Champlain.

The lowland containing the Mohawk and the plains bordering Lake Ontario is the western branch of the Great Valley. It is an important agricultural area, particularly for hops, potatoes, and hay. The slopes of this area are so gentle that it was easy to build the Erie Canal, which connects the Hudson River with Lake Erie. Before railroads came this canal was of supreme importance, and along it have grown up cities like *Rochester*, *Syracuse*, and *Utica*. (See Fig. 220.) These towns have developed, not merely because of the canal, but also because they are agricultural or manufacturing centers. The leading cities of the Hudson Valley are *Albany*, the capital of New York, and *Troy*, the first city in the Union in the manufacture of collars and cuffs.

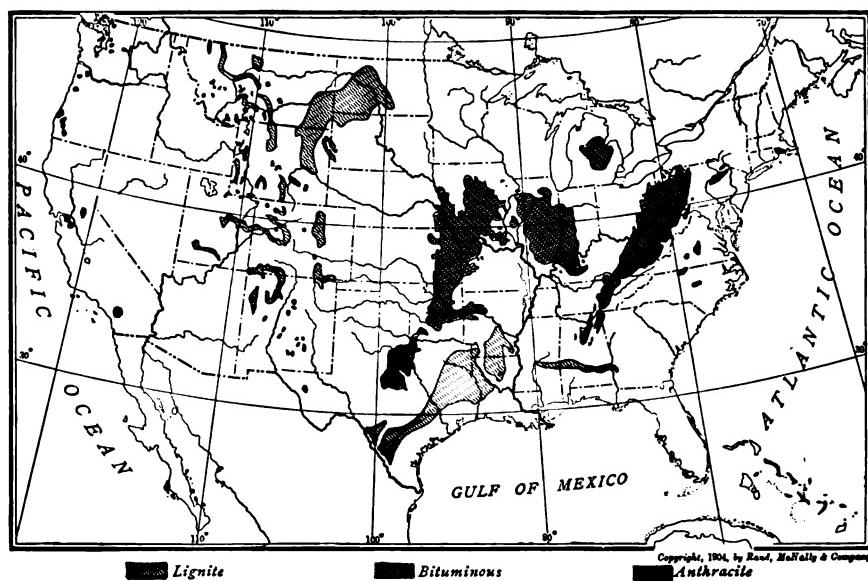
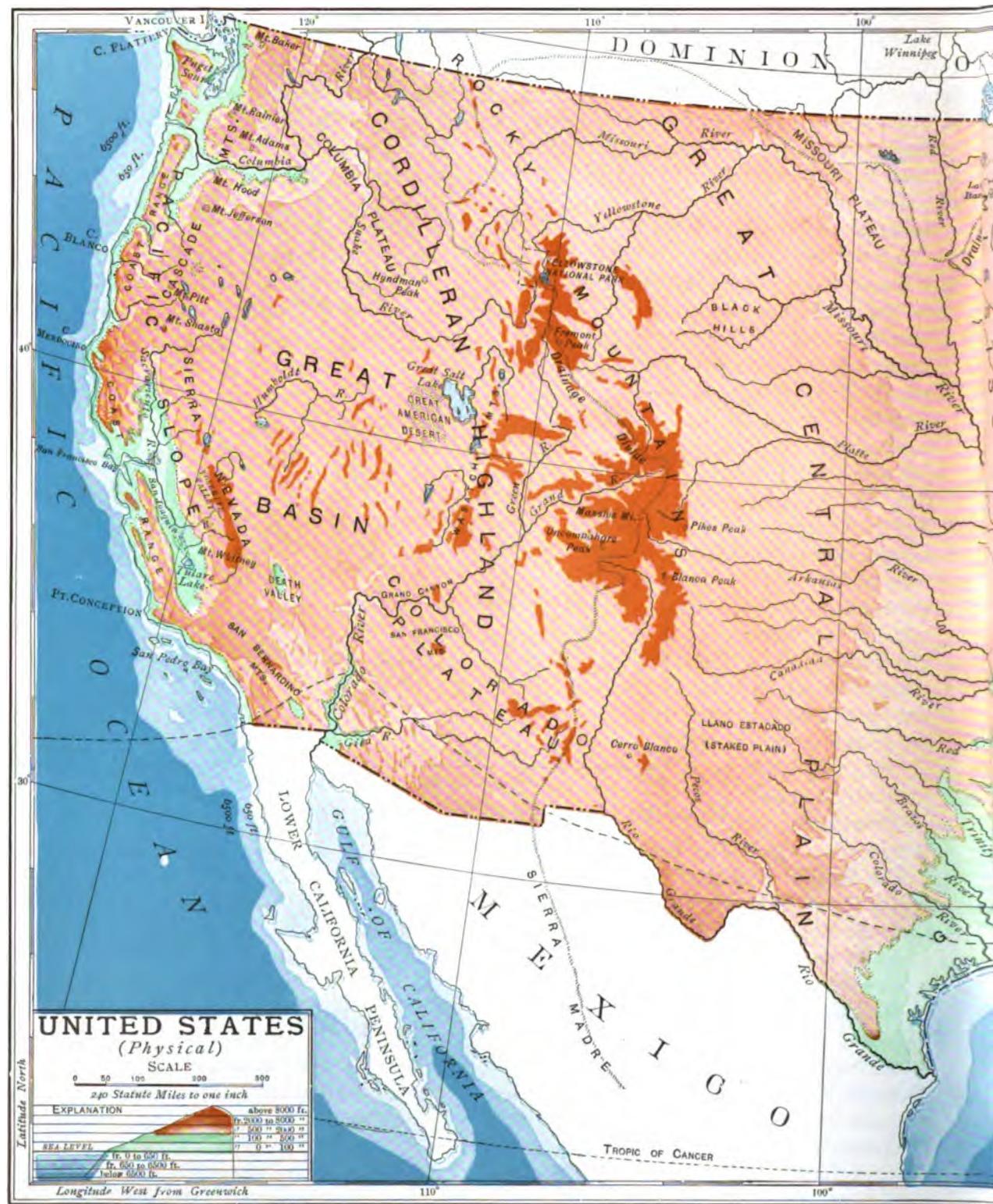


FIG. 221. *The coal fields of the United States.*



Dairying. The western portion of this area, bordering the St. Lawrence and Lake Ontario, and extending southward to the Mohawk Valley, is a great grazing country, in which the milk is largely made into butter and cheese, as it is across the river in Canada. Owing to the distance from a good market and the poor shipping facilities to the great cities, it is impossible to sell the milk profitably, hence the growth of the butter and cheese industry. New York is the first state in the Union in the production of butter and cheese. (See Figs. 224 and 225.)

Cities. The eastern towns of this area, on the shore of Lake Champlain, are centers for lake commerce. They are also points of departure for people entering the Adirondacks. The chief town in this region is *Plattsburg*, a port on Lake Champlain, from which

many summer tourists leave for Canadian camping expeditions. *Saratoga* is situated in a region abounding in mineral springs, and has become a famous summer resort to which thousands of people go each year.

The leading towns of the western portion are *Ogdensburg*, dependent for its growth largely upon its position on the St. Lawrence; *Watertown*, a manufacturing center, power for which is furnished by the Black River, and *Clayton*, at which visitors for the beautiful Thousand Islands leave the railroad.

Questions and Exercises

- (1) How are the boundaries of New York state advantageous?
- (2) Compare Pennsylvania with New York in this respect.
- (3) Compare the surfaces of New York and Pennsylvania.
- (4) Which has the most favorable surface for the development of varied occupations?
- (5) What do you understand by the name "Water Gap" as applied to the Delaware River?
- (6) Find other similar gaps in the Middle States of the Atlantic Coast.
- (7) Trace a railroad

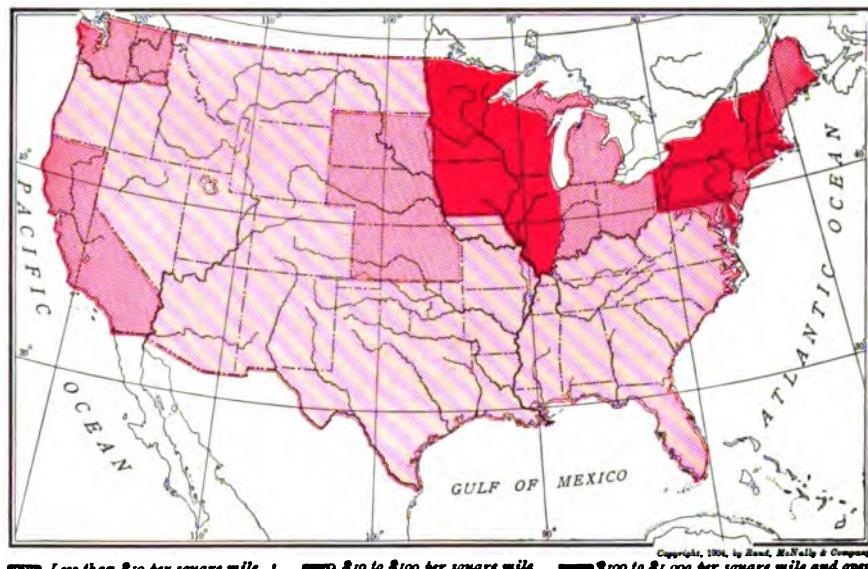


FIG. 224. The areas of the United States devoted to dairying.

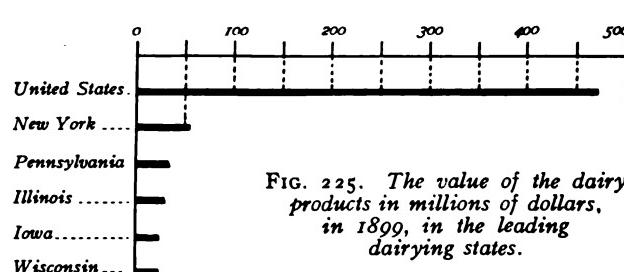


FIG. 225. The value of the dairy products in millions of dollars, in 1899, in the leading dairying states.

- through the Hudson Valley and Gap to Buffalo.
- (8) Locate the chief cities on this road.
 - (9) Why have so many sprung up here?
 - (10) Why is this valley so important?
 - (11) What advantages does a railroad in this valley have over that in the Susquehanna Valley?
 - (12) What rivers make gaps in the Blue Ridge? Trace the railroad routes which cross the mountains through these gaps.
 - (13) Locate the chief coal fields of these states.
 - (14) Why should iron and steel manufacturing

have developed near these fields?

- (15) How is coal from Pennsylvania sent to Boston?
- (16) Draw a map of Pennsylvania showing the coal and iron producing areas. Locate the mining and steel-making towns.

The West Coastal Region. The climate of the west coast of the United States, including the western slopes of the Cordilleran Highland, is unusually even. At low altitudes there is but little change of temperature from month to month. The average winter temperature of San Francisco is as high as that of Charleston, South Carolina (see Fig. 82), and the coastal portion even south of San Francisco has a summer temperature like that of Ontario, New York, and New England. (See Fig. 84.)

day after day, and the temperature rarely approaches the freezing point. As a result this region has become a favorite resort for people who cannot stand the rigor of the eastern winter.

The interior valleys and the plateaus lying between the bordering walls of the Rockies on the one side and the Sierra Nevada and Cascade mountains on the other are extremely dry. In fact, in certain parts of this region the rainfall is less than five inches a year. (See Fig. 188.) Most of this great area is therefore a desert or a steppe in which the population is sparse and scattered. Where irrigation is practiced towns and cities have grown up, but in Arizona, portions of New Mexico, southern Nevada, and eastern California extreme desert conditions prevail. The Mohave Desert, in southern California, is the driest region in the United States. (See Fig. 119.)

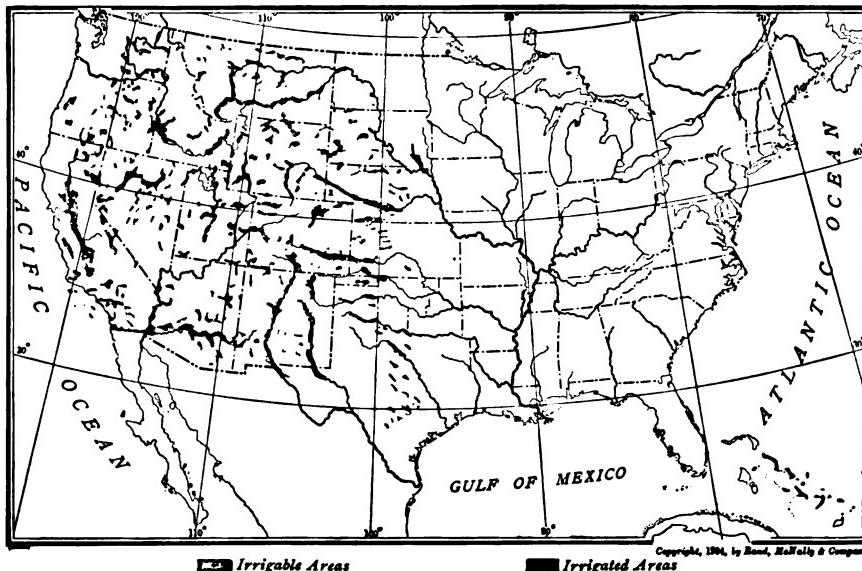


FIG. 190. *Irrigated and irrigable lands in the United States.*

Most of the rain throughout this region falls in winter, when the westerly wind area extends farthest south. In this season the rainfall of Washington, Oregon, and northern California is extremely heavy. (See Fig. 188.) The higher altitudes of this section have abundant moisture, and hence are clothed with heavy forests. But in summer even the mountain slopes are dry. Owing to the lack of summer rainfall, agriculture cannot be carried on in the larger part of this region except by means of irrigation.

The winter climate of southern California is delightful. Warm, fair weather prevails

the United States and its possessions. Write or print the names neatly. (2) On an outline map of the United States indicate its climatic regions; locate your home. (3) Locate on the map Boston, Charleston, Washington, New Orleans, St. Louis, St. Paul, Buffalo, Kansas City, Carson City, San Francisco, San Diego, Seattle. (4) Using two colors, draw arrows for the January and July winds of these towns. (5) Write their January and July temperatures and their average yearly rainfall. (6) Compare the climate of Boston and St. Paul, and of Washington and St. Louis, and account for the difference. (7) Write a similar comparison between the climate of San Francisco and Kansas City, or of San Francisco and Washington. (8) Why has Omaha less rain than Memphis? San Francisco than Seattle? (9) Why is

Questions and Exercises

- (1) On an outline map of the world color in blue
- the United States and its possessions. Write or print the names neatly.
- (2) On an outline map of the United States indicate its climatic regions; locate your home.
- (3) Locate on the map Boston, Charleston, Washington, New Orleans, St. Louis, St. Paul, Buffalo, Kansas City, Carson City, San Francisco, San Diego, Seattle.
- (4) Using two colors, draw arrows for the January and July winds of these towns.
- (5) Write their January and July temperatures and their average yearly rainfall.
- (6) Compare the climate of Boston and St. Paul, and of Washington and St. Louis, and account for the difference.
- (7) Write a similar comparison between the climate of San Francisco and Kansas City, or of San Francisco and Washington.
- (8) Why has Omaha less rain than Memphis? San Francisco than Seattle?
- (9) Why is

the rainfall of Vicksburg so heavy? (10) What portions of the United States are thinly peopled because of the aridity of the region? (11) Study the passage of a cyclone across the *Interior* and *East Coastal* divisions and account for the frequent winter thaws that occur there. (12) Account for a cold wave. (13) How would the presence of an east-west mountain range across these sections change the climate of the southern and southeastern states? (14) Compare the distribution of rainfall and population in the United States. (15) What similarity exists? (16) What influence has amount and distribution of rain had upon the density of population? (17) On the map used in Exercise 2 draw the one hundredth meridian. What is the chief industry to the east of this line? Why? (18) Locate the steppe area. (19) Locate two towns in this area. (20) Name and locate all the regions in the United States where the presence of a mountain barrier makes a difference in the rainfall of the two slopes.

(21) Which climatic division has an *oceanic* climate? (22) What are the characteristics of such a climate? (23) Why does the western coast have so cool a summer? (24) Draw a cross section of the windward and leeward slopes of the Sierra Nevada and show by colors the difference in the rainfall of these slopes; indicate also differences in vegetation. (25) Tell about the winter climate of southern California. (26) Locate the Mohave Desert and give reasons for aridity. (27) Which transcontinental routes pass through large desert areas?

(28) Write a composition about the climate of your home; tell how it affects your life.

XXV. THE UNITED STATES AS A WHOLE; PHYSICAL DIVISIONS

The United States contains several well-marked physical divisions, which vary greatly in their characteristics, and must be considered separately.

THE ATLANTIC AND GULF COASTAL PLAIN

Position. The Atlantic Coastal Plain is a broad, flat, low-lying plain beginning at New York and extending southward throughout the Atlantic Coastal and the Gulf states. It includes the whole of Florida and Louisiana, the larger portion of the state of Mississippi, and the alluvial plain of the Mississippi River south of the Ohio River. The Coastal Plain extends off shore in the great continental shelf. (See Fig. 173.)

Soil. The rocks forming the surface of the

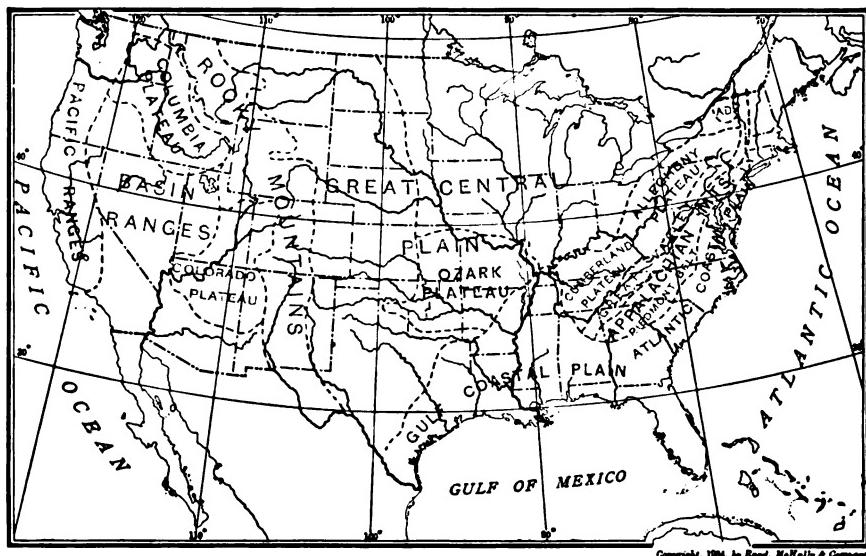
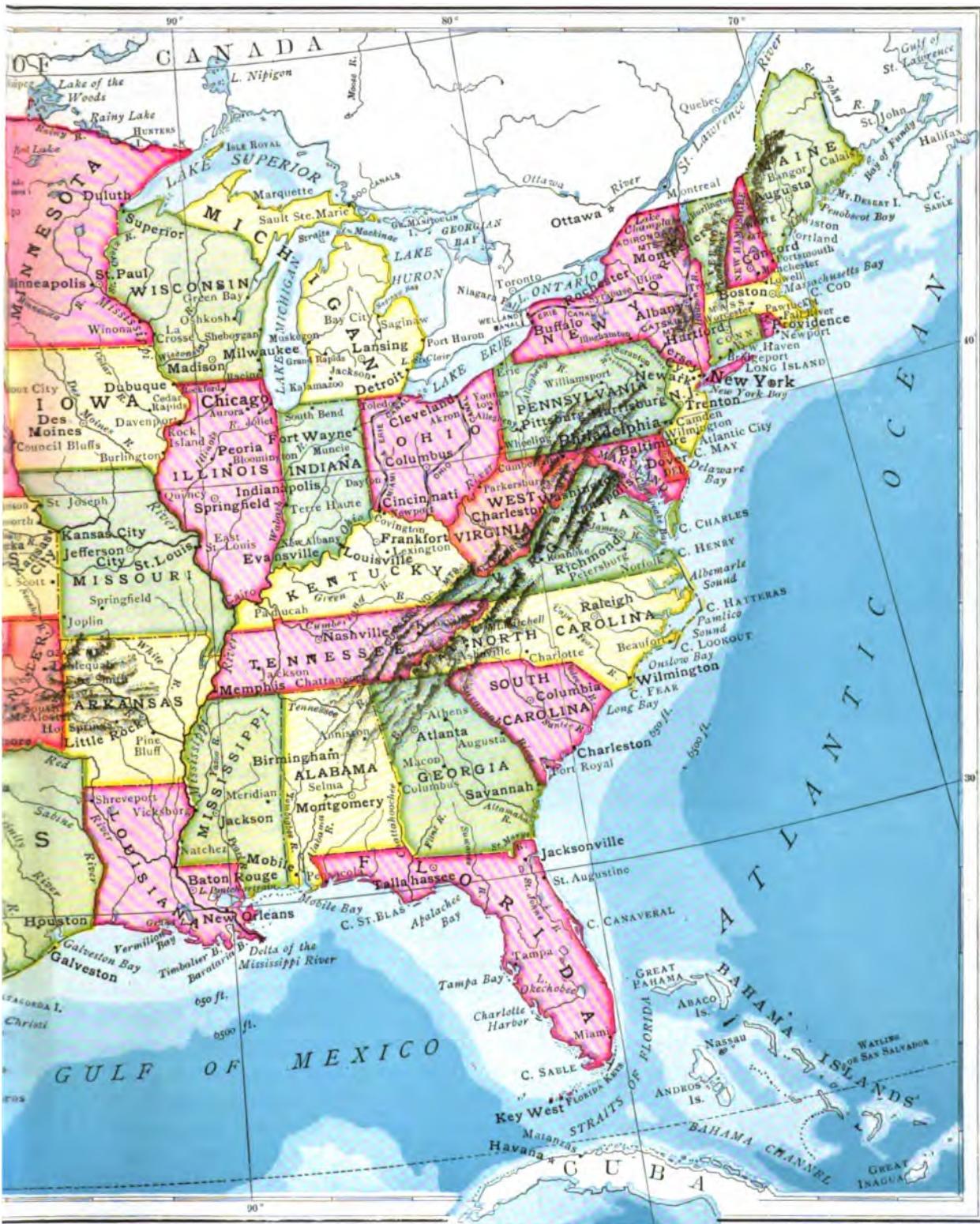


FIG. 191. Physical divisions of the United States.

plain are weak and unconsolidated. The soil is everywhere deep and is generally fertile, but its fertility depends upon the character of the underlying rock from which it has been formed. In some of the states, as in North and South Carolina, broad strips of barren soils occur. These areas are covered with forests, while the other soils are for the most part devoted to agriculture. The coastal portion of this area, in the Southern States of the Atlantic Coast, is made up of marshes which are devoted to the cultivation of rice.

Surface and Drainage; Coast Line. The valleys are generally narrow, steep-sided, and shallow, because the plain rises so little





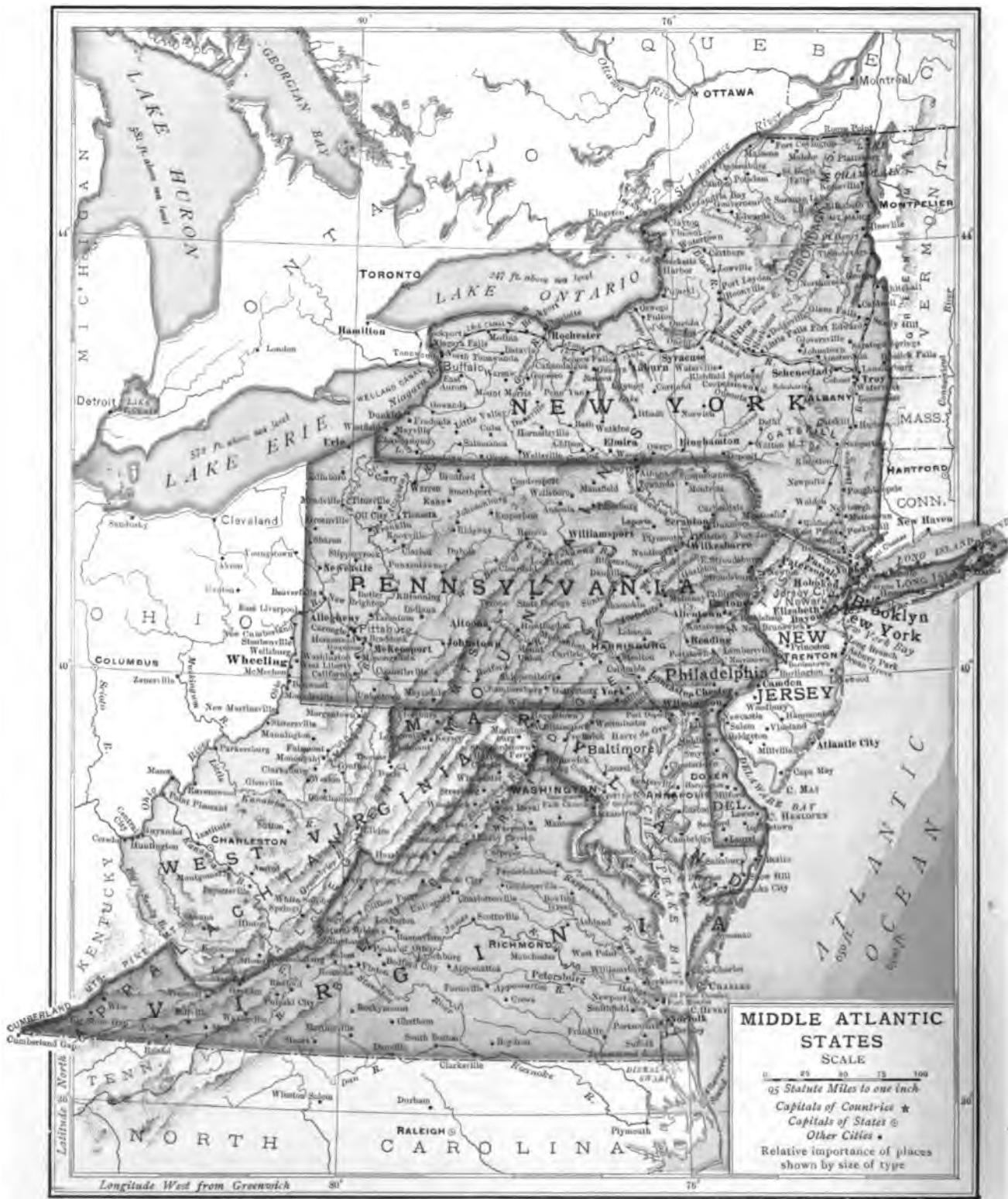


FIG. 215.

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in securing trade with the regions lying to the west of the Appalachian Highland.

DISTRICT OF COLUMBIA

The District of Columbia, with an area of sixty-four square miles, was laid out as a Federal District to contain the capital of the United States when the great western territory was little known, and when it was not expected that some day the United States would stretch from sea to sea.

The Capital. The city of *Washington*, which lies in the District of Columbia, is beautifully laid out. As the capital of the United States it contains the great Capitol Building with its impressive dome (see Fig. 234), the White House, the home of the President (see Fig. 236), and many large and beautiful public buildings in which the national business is conducted. Most of these buildings are visited annually by thousands of people from every part of the country. The most beautiful buildings are the Library of Congress (see Fig. 235) and the new Pension Building. The great monument to President Washington, 555 feet high, affords a fine view of the city, which rises from the quiet Potomac in a series of terraces.

Washington is not a port of importance, but it has daily steamboat connection with



FIG. 235. *The Congressional Library at Washington.*

Norfolk, Va., and is the point from which visitors take boat or car for Mount Vernon, the fine old colonial home of President Washington, a few miles down the river.

Questions and Exercises

- (1) Give the chief reasons why New York has outgrown Philadelphia in importance.
- (2) Give the reasons for the location of Buffalo, Baltimore, Pittsburg, Trenton, and Scranton.
- (3) Make a list of the products which are dependent on the climate; those that are dependent chiefly on the surface. (4) Draw diagrams showing the location and commerce of Buffalo, Pittsburg, and New York City, and show their connection by railroads with the larger cities of this section.
- (5) Name the chief imports of New York City; its chief exports.
- (6) Why should Philadelphia be an important manufacturing city?
- (7) What advantages in securing western trade has New York over Baltimore?
- (8) What advantage has Baltimore over New York?
- (9) Name the chief places in these states noted for their scenic beauty. Describe any one you have seen or of which you have seen pictures.
- (10) Name the chief places in these states noted for their historic associations. Describe any of these places you have visited or seen pictures of.
- (11) Why was the city of Washington located where it is?



FIG. 236. *The White House, the home of the President.*

XXXI. SOUTHERN STATES OF THE ATLANTIC COAST

STATE	Abbreviation	Area in sq. miles	Population 1900	Chief City	Population 1900	Capital
North Carolina	N. C.	52,250	1,893,810	Wilmington	20,976	Raleigh
South Carolina	S. C.	30,570	1,340,316	Charleston	55,807	Columbia
Georgia	Ga.	59,475	2,216,331	Atlanta	89,872	Atlanta
Florida	Fla.	58,680	528,542	Jacksonville	28,429	Tallahassee

The four Southern States of the Atlantic Coast have an area about three times as large as that of New England. Owing to their warm summer climate and excellent soils, they, together with the Southern States of the Mississippi Basin, form the great cotton-producing region of the country. The larger portion of the area lies in the coastal plain and the Piedmont Belt, and hence has gentle slopes. (See Fig. 191.) The region is primarily an agricultural area, though cotton manufacturing is increasing in places, owing to the excellent water power and the abundant supply of raw material. (See Fig. 210.)

THE ATLANTIC COASTAL PLAIN

The coastal plain area of the Southern States of the Atlantic Coast includes all of Florida, more than half of South Carolina and Georgia, and nearly half of North Carolina. With the exception of the northwestern corner of Georgia, which contains the southern portion of the Great Valley, the rest of these states is in the Piedmont Belt or the Appalachian Mountains.

Surface and Climate. The coastal plain is generally flat with only a few sand hills rising above the general lowland in South Carolina and Georgia. These sand hill regions are generally covered with forests, par-

ticularly of hard pine, from which turpentine and tar are obtained in large quantities.

The success of agriculture in this region, particularly cotton raising and rice production, depends upon the climate as much as upon the character of the soil. Owing to the influence of the ocean, spring is well developed early in March, and the growing season is long. The cotton crop requires an early spring, a late fall, plenty of heat in the summer, without too much rainfall; conditions

all of which are met in these states.

Owing to the warm winter climate, the coastal portions of Florida are favorite resorts for northern people at that season. This is particularly true of Jacksonville, St. Augustine, and Tampa.

The offshore portion of the coastal plain is

a slightly submerged continental shelf, over which the warm waters of the Gulf Stream sweep. It is studded with coral islands or keys, of which the Florida Keys are the most important. On one of these is situated Key West, famous for its tobacco manufactures and for the exportation of sponges, which are secured from the eastern portion of the Gulf of Mexico.

Agriculture. Bordering the coast and on the offshore islands of South Carolina, Florida,



FIG. 237. Picking cotton in Georgia.

SOUTHERN STATES OF THE ATLANTIC COAST

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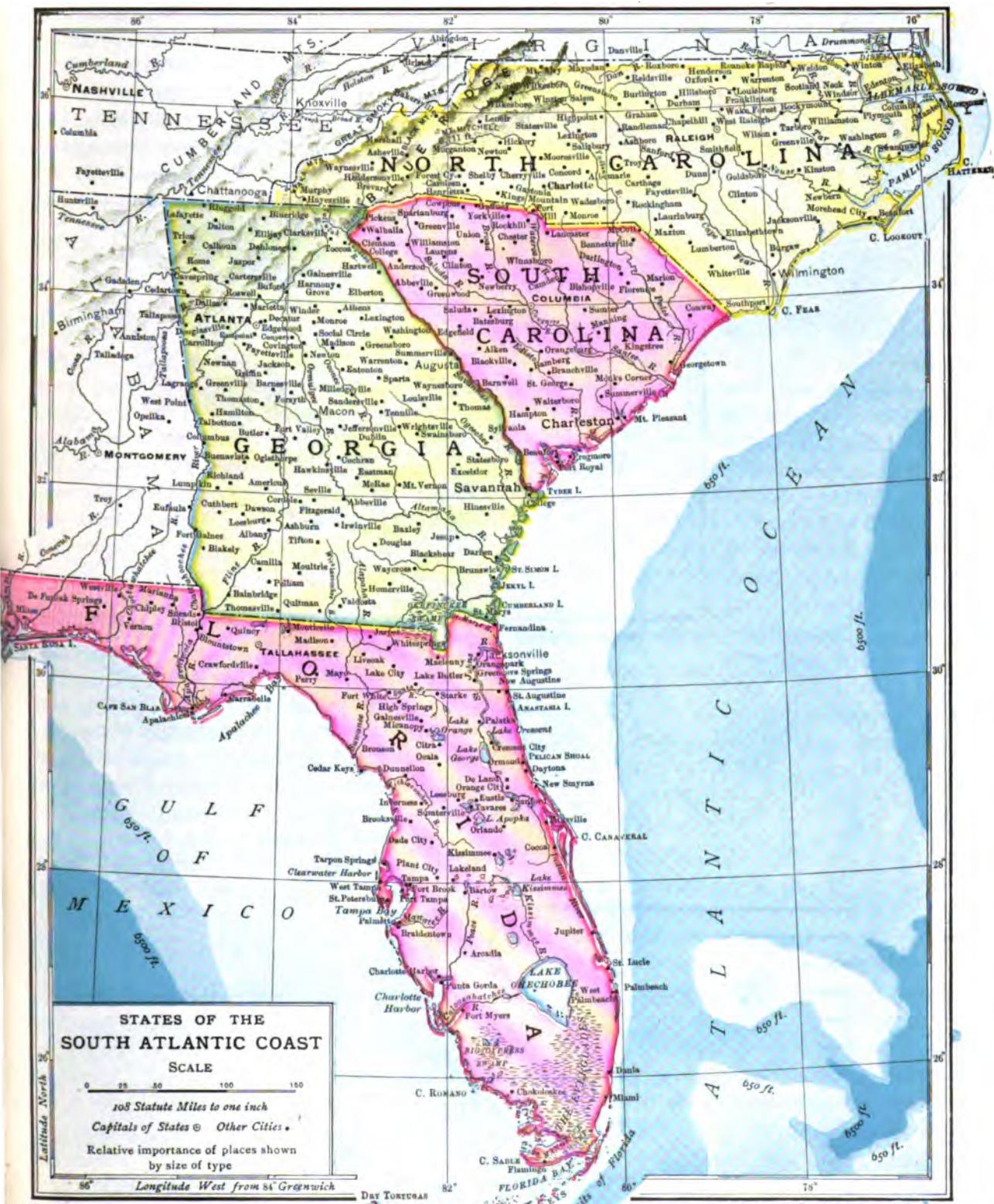


FIG. 238.

and Georgia, are extensive areas devoted to the production of "sea-island cotton." The fiber of this cotton is long and of great strength, so that it is particularly valuable for certain kinds of spinning. (See Fig. 237.)

In the marshy lowlands of South Carolina, Georgia, Florida, and North Carolina rice is an important crop. The seed is planted in the early spring when the marshes are flooded, and the fields have to be kept covered by water during a large part of the growing season. The production of rice in these states, however, is small as compared with the enormous crops of Louisiana and Texas.

Sugar cane is grown in the coastal plain sections of Florida and Georgia, these states ranking third and fourth in production. With the exception of Florida, the rest of the coastal plain area, not devoted to rice, is planted largely to upland cotton and vegetables.

In Florida the coastal plain rises in few places over a hundred feet above the level

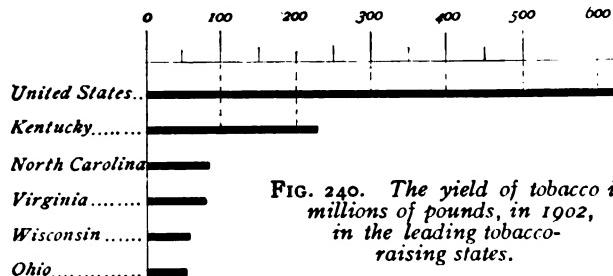


FIG. 240. The yield of tobacco in millions of pounds, in 1902, in the leading tobacco-raising states.

of the sea. As a result large parts of this region are not adequately drained, and extensive swamps exist, some of which have scarcely been explored.

The climate of Florida is warm and moist,

and subtropical in character. Such a climate is particularly favorable for the raising of oranges, lemons, and grape fruit, yet California far outranks Florida in the production of these fruits. Florida is unique among the other states in that it produces pineapples. (See Fig. 242.) It also raises practically all

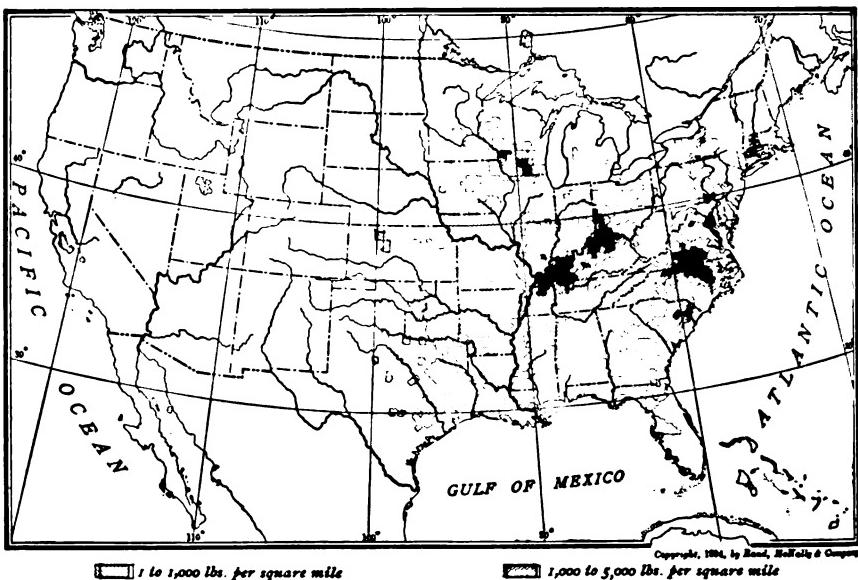


FIG. 239. The yield of tobacco per square mile in the United States.

the limes grown in the United States, and leads the country in the production of guavas. These crops depend largely on the climate, and if a cold wave suddenly sweeps into northern Florida great damage follows.

Mineral Products. The rocks of the coastal plain area of Florida and South Carolina contain a great wealth of phosphate, which is valuable as a fertilizer. Florida leads the Union in the production of phosphate.

Cities. The coast of this group of states is generally bordered by barrier beaches, the extensive lagoons inside of which are too shallow to form good harbors. The chief cities of the coastal plain are *Charleston*, S. C., and *Savannah*, Ga., both of them cotton and rice ports, and *Wilmington*, N. C. *Pensacola* and *Tampa* are the leading commercial cities

of Florida. Tampa is a great tobacco manufacturing city; the tobacco used there is largely imported from Havana.

THE PIEDMONT BELT

Agriculture. The Piedmont Belt in the Southern States of the Atlantic Coast is a beautiful, rolling country in which agriculture is the principal industry. Cotton is grown in the southern portion but in the northern tobacco is the chief crop. North Carolina is the second state in the Union in the production of tobacco, and Georgia is third in cotton. Corn is an important crop in this section. Southern corn requires a longer season for growth than northern, hence this variety never reaches maturity in the northern states. It is grown in the North, however, frequently for forage. No one of the southern states produces sufficient corn to be ranked among the leading corn-producing states, although this crop is grown in some abundance in all the states. Fruit growing is steadily increasing. Peaches are an important crop in Georgia.

Manufacturing. The Piedmont Belt is favored with beautiful streams which flow down from the higher Appalachian Mountains to the west, and has an abundance of water power for manufacturing. Within the last few years this water power has been more and more used, till manufacturing has become an important industry, particularly in the Pied-



FIG. 242. A field of pineapples in Florida.

mont area of North and South Carolina and Georgia. At the present time South Carolina is, next to Massachusetts, the largest cotton-manufacturing state in the Union. (See Fig. 211.) The chief centers for this industry in the South are *Columbia*, *Greenville*, and *Spartanburg*, S. C., *Charlotte*, N. C., and *Augusta*, *Atlanta*, and *Columbus*, Ga. (See Fig. 241.)

APPALACHIAN MOUNTAINS AND GREAT VALLEY

The Appalachian Mountains reach their greatest height and beauty in North Carolina, where they are densely covered with forests. Here are a number of large private parks or forest preserves. These mountains, owing to the quality of the air, their cool summers, the magnificent water supply, and the grandeur of their scenery, are becoming more and more popular as resorts. *Asheville*, N. C., is the center of this region.

Mineral Products. The rocks of this region contain a certain amount of gold, but as yet the mineral industry of this part of the South is only slightly developed.

In the northwestern portion of Georgia the Great Valley contains immense quantities of iron, which is mined to a certain extent, and manufactured at *Rome* and *Atlanta*, Ga. The valleys, deeply set among the Appalachian Mountains, are underlaid by marble



FIG. 241. Cotton mills at Augusta, Georgia.

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deposits which are extensively quarried. The marble of northwestern Georgia is the whitest and purest found in this country.

Cities and Trade. The trade of the Southern States of the Atlantic Coast is largely with the North and with the Southern States of the Mississippi Basin, either by water or rail. Foreign commerce is small owing largely to poor harbors. *Savannah*, and *Brunswick* Ga., and *Pensacola* Fla., are the principal ports in the order of their importance. Pensacola and Tampa trade largely with other Gulf ports and with Cuba. Savannah has a large coasting trade with New York, Philadelphia, and Boston, and is an important cotton port. Most of the lumber from this group of states is shipped from *Pensacolo*, and the naval stores go from *Fernandina*, Fla.

The largest inland city of this region and the leading interior wholesale market of this group of states is *Atlanta*, Ga., situated in the Piedmont Belt and having excellent railroads running in all directions. It is connected

with the northern cities by two trunk lines and is so situated that it has excellent communication with Chattanooga and the Great Valley. It is the railroad center of these states, and is sometimes called the Gate City of the South.

Questions and Exercises

- (1) Make a list of the states of this region in which cotton is grown.
- (2) Find the summer temperature and rainfall of the cotton-producing area.
- (3) Locate the rice-producing area.
- (4) In what states is rice grown?
- (5) Why must the United States import so much rice?
- (6) From what country does it come? To what ports?
- (7) Locate the sugar cane section.
- (8) Where are cotton factories located?
- (9) Account for their location here.
- (10) What effect will the growth of cotton manufacturing in the South have upon the towns in New England?
- (11) Locate the chief cotton and rice ports.
- (12) In what physical divisions is cotton grown? Tobacco? Which physical division has facilities for manufacturing?
- (13) Where is the densest population of this region? The least dense?
- (14) Give the chief advantages in the location of Atlanta.
- (15) Why is it called the "Gate City of the South"?

XXXII. SOUTHERN STATES OF THE MISSISSIPPI BASIN

STATE	Abbreviation	Area in sq. miles	Population 1900	Chief City	Population 1900	Capital
Tennessee.....	Tenn....	42,050	2,020,616	Memphis.....	102,320	Nashville
Alabama.....	Ala....	52,250	1,828,697	Mobile.....	38,469	Montgomery
Mississippi.....	Miss....	46,810	1,551,270	Vicksburg....	14,834	Jackson
Louisiana.....	La....	48,720	1,381,625	New Orleans..	287,104	Baton Rouge
Texas.....	Tex....	265,780	3,048,710	San Antonio..	53,321	Austin
Arkansas.....	Ark....	53,850	1,311,564	Little Rock...	38,307	Little Rock
Oklahoma (Ter.)	Okla....	39,030	398,331	Oklahoma....	10,037	Guthrie
Indian Territory	Ind. T..	31,400	392,060	Ardmore....	5,681	(No capital)

The several states which we may group together as the Southern States of the Mississippi Basin contain nearly one-fifth of the whole area of the United States. With the exception of the Cumberland Plateau, which occupies portions of Tennessee and Alabama, and the Ozark and Ouachita mountains of Arkansas, this whole region is a great plain.

THE COASTAL PLAIN

Products of the Soil. Owing to the level surface, the magnificent soils, and the favorable climate, all of the coastal plain east of central Texas is a great cotton, sugar, and rice producing area. Sugar cane is raised largely in the river bottoms of the alluvial plain of the Mississippi, and in the lowlands of Texas. (See Figs. 245 and 246.) Louisiana

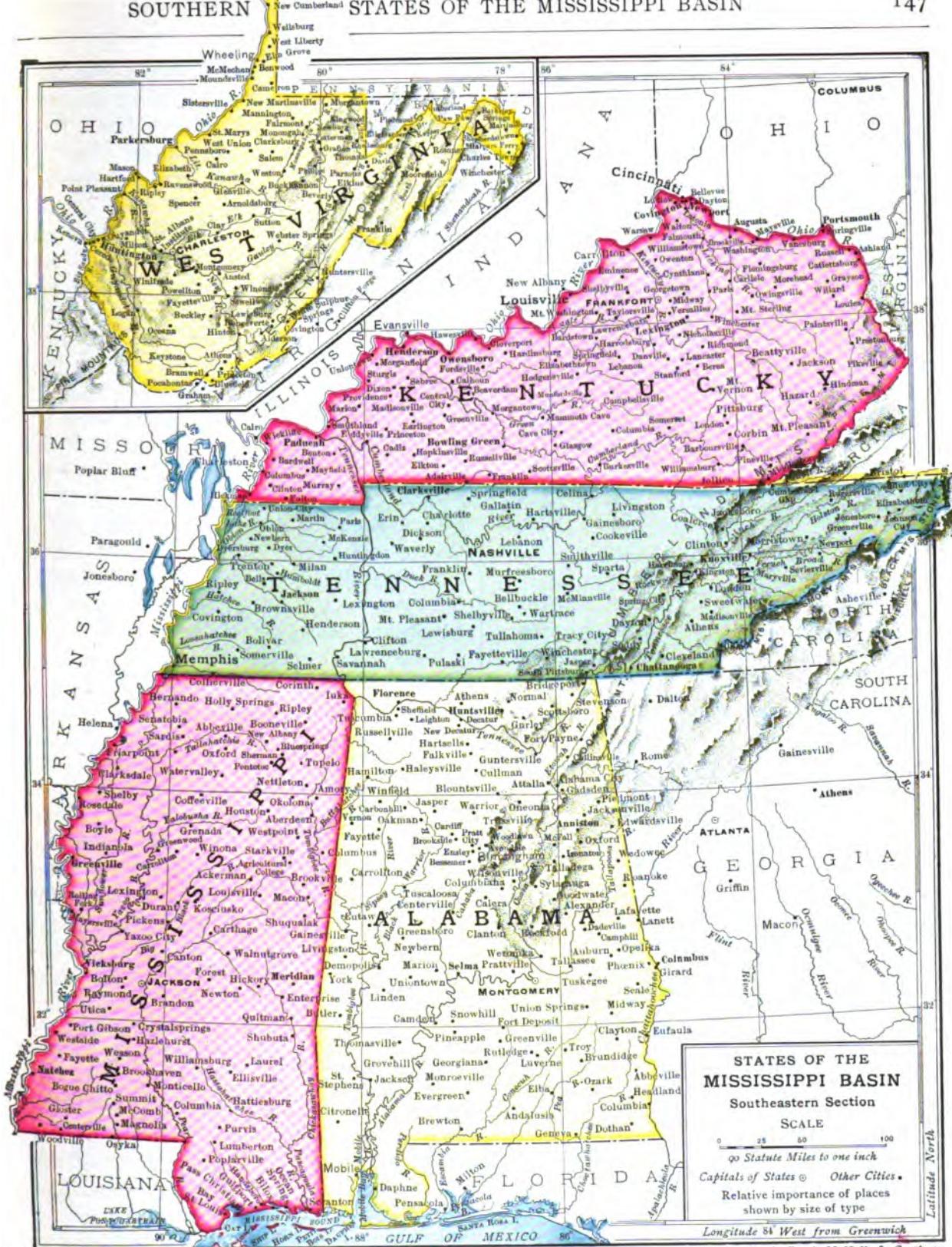


FIG. 243.

has more than 100 times the sugar product of Texas, the next state in importance. In the production of rice, Louisiana leads the country, and Texas is second in importance. Cotton is raised in all the states, but Texas produces much more than Mississippi, the second state in the Union in cotton production. (See Figs. 247 and 249.) Alabama is fourth, and the other states of the group take lesser rank in this industry. Cotton seed yields cotton-seed oil, an important product wherever cotton is raised. Berries and early vegetables for the northern markets are grown throughout these states.

Mineral Products. The only important mineral products in the coastal plain area are petroleum in eastern Texas, and salt in Louisiana. Texas now ranks second among the states in the production of petroleum.

Cities and Trade. The chief cities of the coastal plain are *New Orleans*, La., the third

of the great ports of the country, *Galveston*, Tex.; *Mobile*, Ala.; *Houston*, Tex.; *Memphis*, Tenn.; *Natchez* and *Vicksburg*, Miss. These are all centers for the exportation of cotton.

The most important city is *New Orleans*, situated about a hundred miles up the Mississippi River, and easily reached by ocean-going vessels. (See Fig. 244.) It is a center for railroad connections with the North and with the East by lines of road passing up the Great

Valley, or along the Piedmont Belt, or on the coastal plain. It is the chief cotton-exporting city in the world. Its commerce is largely with England, France, and other European countries.

Galveston, Tex., on Galveston Bay, has the best harbor in the state, and is the leading commercial center. Owing to its position near the great cotton fields, it is a most important cotton port, with a large foreign commerce, especially with Germany and France. *Houston*, Tex., connected by rail and by water with Galveston, is the leading cotton-packing city of Texas. *Mobile* is the principal shipping point in Alabama, not only for cotton but for other products.

THE GREAT VALLEY

The eastern portion of Tennessee and the northern portion of Alabama are occupied by the Great Valley and



FIG. 244. Along the water front at New Orleans.

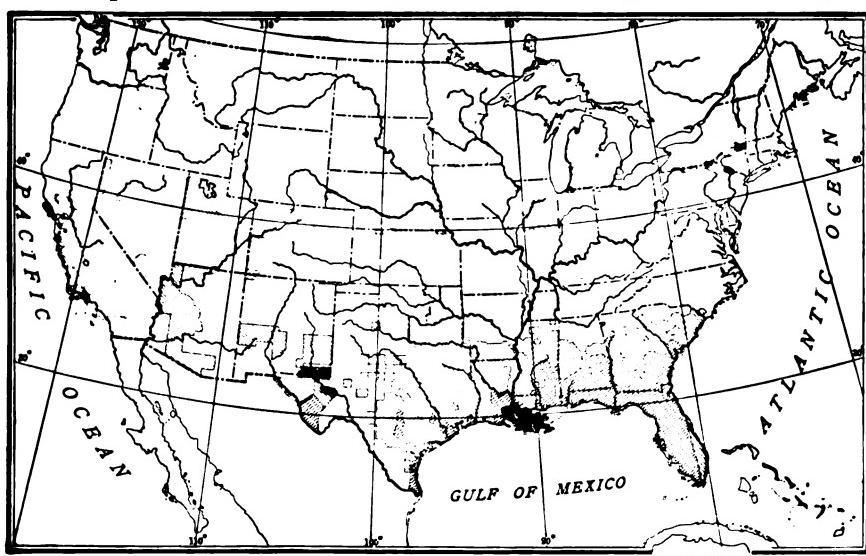


FIG. 245. Proportion of improved land in the United States devoted to the sugar industry.

the Cumberland Plateau. The Great Valley is a rich agricultural area and contains great quantities of limestone and iron. Marble is quarried at *Knoxville*, Tenn., while the local supplies of coal, iron, and limestone make *Birmingham*, Ala., one of the great iron-manufacturing cities of the Union. Birmingham is thus becoming the Pittsburgh of the southern states. The hardwood forests found on the Cumberland Plateau and the Appalachian Mountains supply an abundance of material for the furniture factories of *Knoxville* and *Chattanooga*, Tenn., and other cities in the Great Valley. The Great Valley in eastern Tennessee is important as a highway of travel and transportation. Hence it contains all the large cities to be found in this section of the state.

THE CUMBERLAND PLATEAU

The Cumberland Plateau is a broad highland facing the Great Valley in a continuous cliff, uncut by any river except the narrow Tennessee, which is navigable to Knoxville at certain seasons.

Industries. The Cumberland Plateau has few railroads, owing to the difficulty of reaching its top. It is covered by dense forests of hardwood, and occupied by an extremely scattered population, who get their living mainly by raising such crops as are necessary for their own consumption, or by grazing. The people of this region have

remained isolated so long that they have developed very slowly, and many of them live lives as primitive as their ancestors did a hundred years ago. There are no large cities, and good-sized towns exist only where coal mines have been opened. A vast wealth of coal underlies this region, yet mining has been developed at but few places.

The Cumberland Plateau merges on the west into a series of rich limestone lowlands. *Nashville*, the

capital of Tennessee, in the center of these lowlands in a fine agricultural country, has important manufactures of flour and furniture. This region also produces phosphate.

Kentucky far outranks any other state in the production of hemp and tobacco (see Fig. 240) and Louisville is the chief leaf tobacco market of the world.

THE PLAINS AND THE OZARKS

In the low-lying portions of Arkansas agriculture with horticulture is the principal

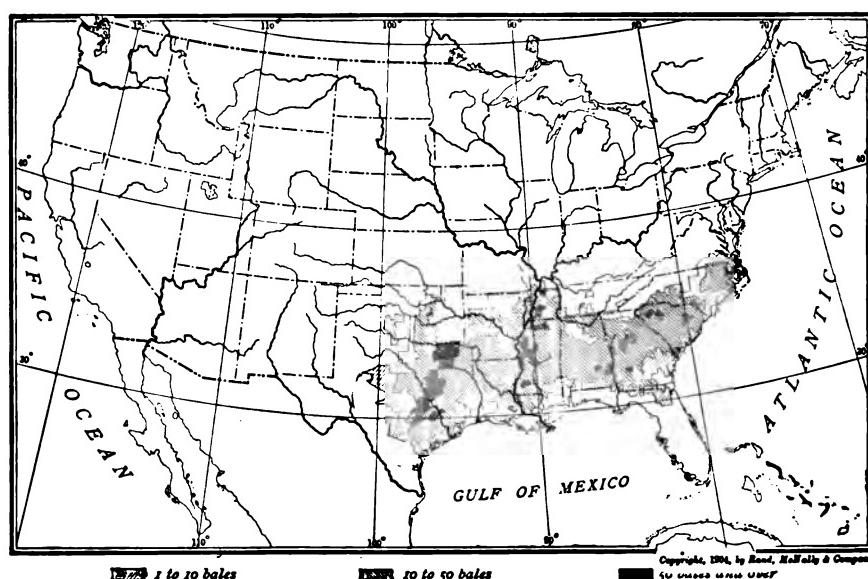
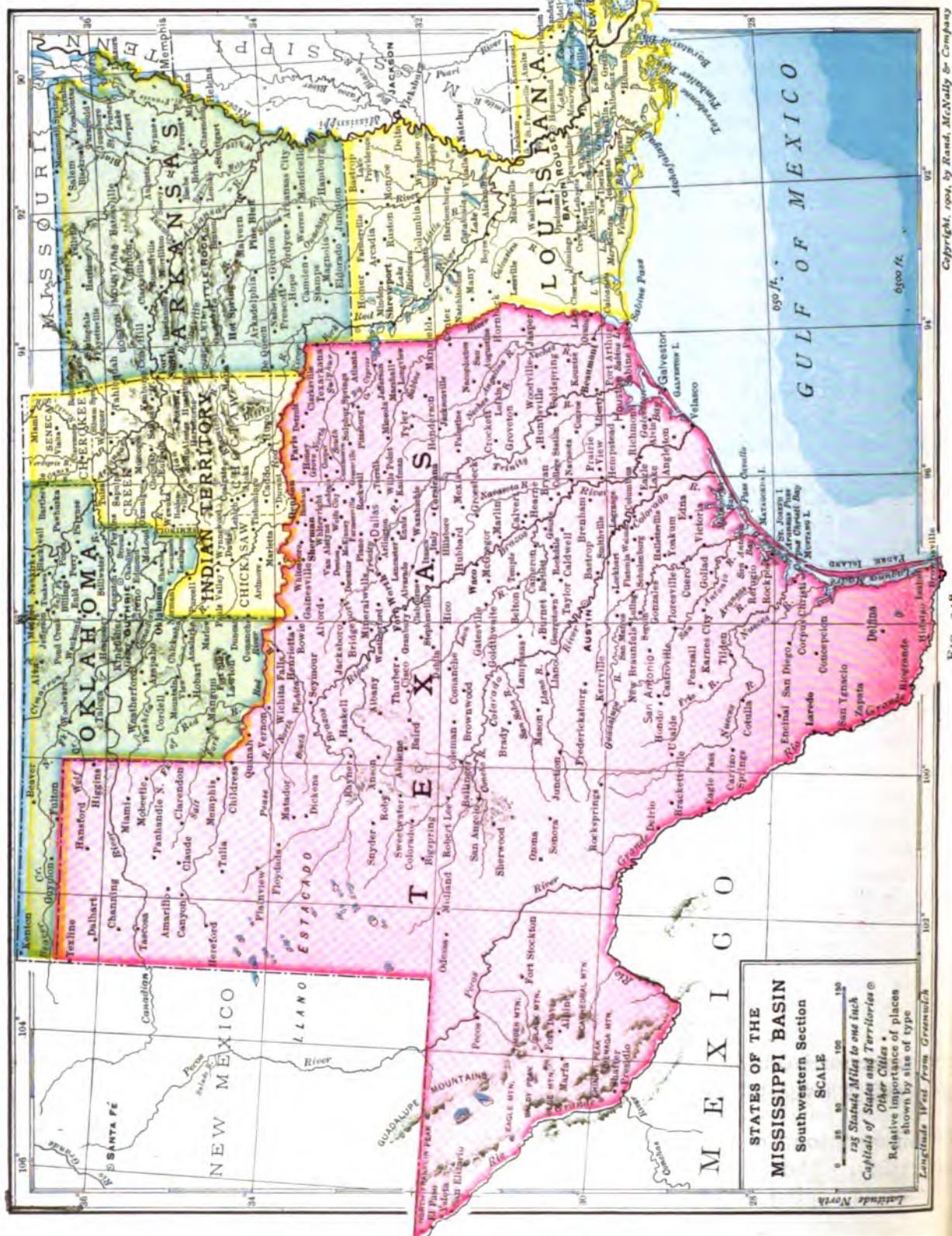


FIG. 247. The yield of cotton per square mile in the United States.



occupation though coal is an important product in the Indian country and in Arkansas.

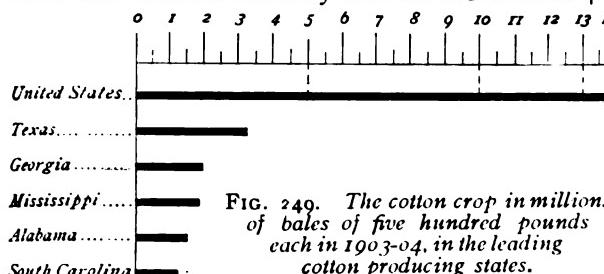


FIG. 249. The cotton crop in millions of bales of five hundred pounds each in 1903-04, in the leading cotton producing states.

In the forested region lumbering is an important industry. *Little Rock* is the capital and chief town in Arkansas. *Hot Springs* is famous as a health resort.

Grazing. Western Texas and Oklahoma are primarily grazing regions, owing to the dry climate. As one passes through Texas he finds himself at Houston in the center of a great cotton-producing region, with luxuriant vegetation everywhere. Between Houston and San Antonio the cotton becomes less conspicuous and a little west of San Antonio the arid country begins. Here

only those plants are seen which will grow with a scanty supply of moisture, while in western Texas the vegetation is almost that of the desert. This great western region is so dry that grazing is practically the only occupation, and cattle, horses, and mules are raised in larger numbers in Texas than in any other state. (See Figs. 250 and 251.) Texas is one of the principal food-producing regions of the Union because of its development of the cattle industry, although throughout a large part of its area agriculture is impossible except by irrigation.

Formerly the cattle were mostly wild stock, not particularly valuable for their flesh. In recent years the quality of the cattle has been improved, hence the importance of the grazing industry has increased. Until within a few years the cattle were allowed to wander at will over the great plains, being tended by herdsmen or cowboys. Now large parts of the area have been surrounded by fences, some of the great ranches containing many square miles, so that caring for the cattle is much easier. The cattle throughout this region are largely

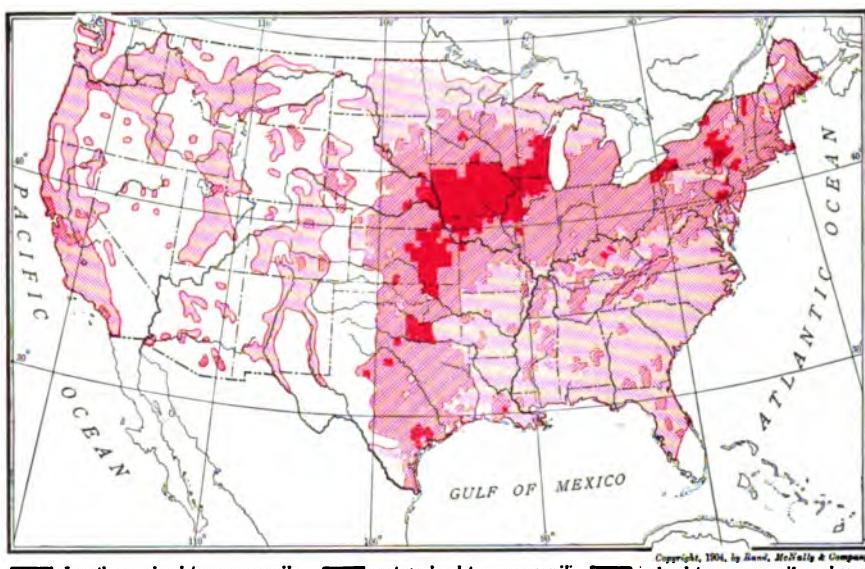


FIG. 250. The number of cattle per square mile in the United States.

shipped alive to the great slaughtering cities of the northern Mississippi Basin, although some are sent directly to the seaports and shipped alive to foreign countries.

Cities. Throughout this vast grazing area in the West, large enough to hold many of the states of the Union, there are naturally but few cities. The only important one in Texas is *El Paso*, which is a small railroad center on the Mexican boundary line. *Guthrie* and *Oklahoma*, in Oklahoma, have developed rapidly within a few years. Oklahoma and Indian Territory are both territories under

the control of the National Government. By a recent law of Congress these territories are to become the state of Oklahoma when they have adopted a constitution and formed a state government.

The new state will probably be admitted to the Union in 1907. Indian Territory, largely occupied by Indians, is but little developed.

Questions and Exercises

(1) Name the advantages in the location of New Orleans. (2) Trace its railroad connections with the North, the East, and the West. (3) What does it export to European countries? (4) Find out, if you can, how the Mississippi River

has been made accessible to ocean steamers. (5) What were the drawbacks to the harbor of Galveston? (6) Why is it an important port? (7) What effect will the opening of the Panama Canal have upon New Orleans? (8) What effect upon Galveston?

(9) Why is Birmingham called the "Pittsburg of the South"? (10) Why should a city have grown up at Chattanooga? (11) State the importance of the Great Valley as a highway of travel. (12) Make a list of the cotton ports of

the United States. (13) Make a list of all the cotton manufacturing towns of the country. (14) Why is Texas a great stock-raising state? (15) Where are the cattle shipped to be slaughtered?

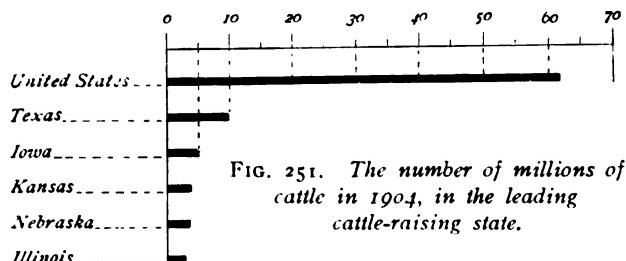


FIG. 251. *The number of millions of cattle in 1904, in the leading cattle-raising state.*

XXXIII NORTHERN STATES OF THE MISSISSIPPI BASIN

STATE	Abbreviation	Area in sq. miles	Population 1900	Chief City	Population 1900	Capital
West Virginia.....	W. Va.	24,780	958,800	Wheeling.....	38,878	Charleston
Ohio.....	Ohio	41,060	4,157,545	Cleveland.....	381,768	Columbus
Kentucky.....	Ky.	40,400	2,147,174	Louisville.....	204,731	Frankfort
Indiana.....	Ind.	36,350	2,516,462	Indianapolis.....	169,164	Indianapolis
Illinois.....	Ill.	56,650	4,821,550	Chicago.....	1,698,575	Springfield
Michigan.....	Mich.	58,915	2,420,982	Detroit.....	285,704	Lansing
Wisconsin.....	Wis.	56,040	2,069,042	Milwaukee.....	285,315	Madison
Minnesota.....	Minn.	83,365	1,751,394	Minneapolis.....	202,718	St. Paul
Iowa.....	Iowa	56,025	2,231,853	Des Moines.....	62,139	Des Moines
Missouri.....	Mo.	69,415	3,106,665	St. Louis.....	575,238	Jefferson City
Kansas.....	Kans.	82,080	1,470,495	Kansas City.....	51,418	Topeka
Nebraska.....	Nbr.	77,510	1,066,300	Omaha.....	102,555	Lincoln
South Dakota.....	S. Dak.	77,650	401,570	Sioux Falls.....	10,266	Pierre
North Dakota.....	N. Dak.	70,795	319,146	Fargo.....	9,589	Bismarck

The group of states in the Northern Mississippi Basin includes six out of the first ten states in manufacturing and population, and seven of the first ten in agriculture. They are, therefore, one of the most important groups of states in the Union. Although they were hardly settled three-quarters of a century ago, they now contain about one-third of the entire population of the United States.

Surface and Soils. As we have already seen, the surface and climate of the Northern States of the Mississippi Basin are generally favorable for agriculture, except in the few highlands and in the western section where the climate is too dry. The fine glacial soils of the eastern and northern portions are exceptionally fertile and will grow excellent crops for many years in succession without being as easily worn out as are the

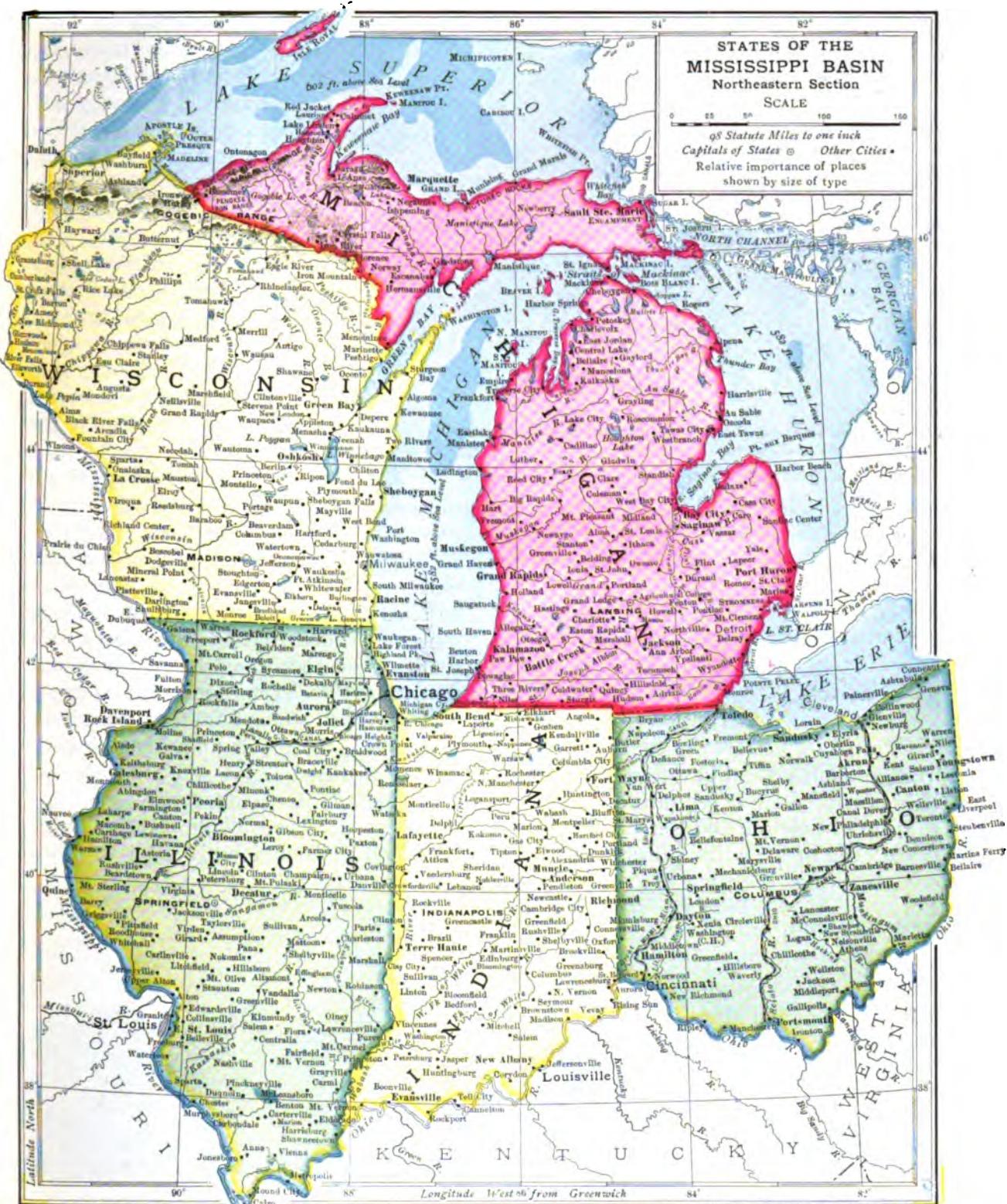


FIG. 353.

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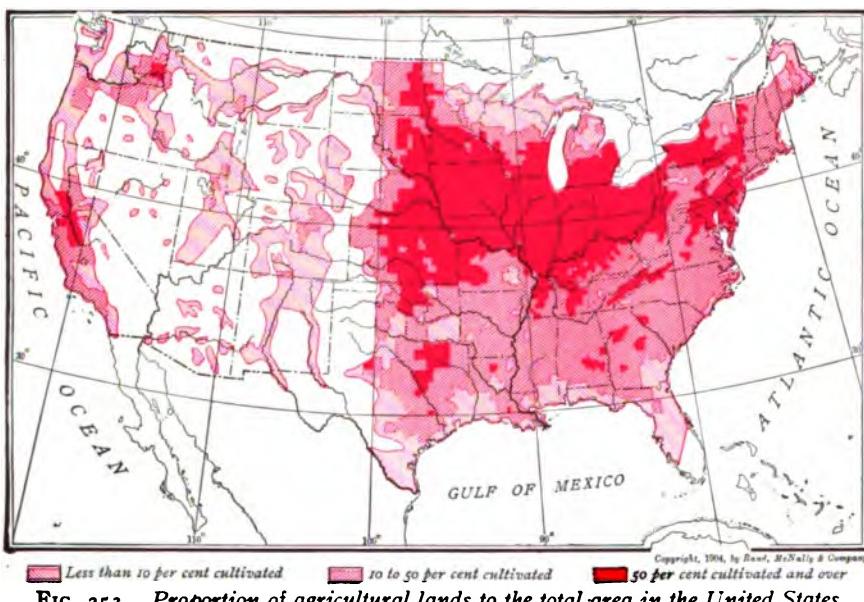


FIG. 253. Proportion of agricultural lands to the total area in the United States.

soils of the southern states. The highland areas are covered with forests and some of them contain mineral wealth of great value.



FIG. 254. Threshing on the prairies of Illinois.

Therefore mining and lumbering are occupations of importance in certain states. Owing to the favorable soil and climate, this region is the chief area for the growing of wheat, corn, oats, and barley, and is very important for the raising of horses, cattle, and hogs.

Climate and Vegetation. Throughout the Northern States of the Mississippi Basin the climate is warm in summer, and the rainfall is abundant except in the extreme western portion. Through the cen-

tral portion of North and South Dakota, Nebraska, and Kansas the rainfall is usually sufficient for agriculture, but sometimes droughts occur, and therefore the success of this occupation is doubtful. For this reason many of the farmers who first settled in this area have migrated to other regions, where the success of their efforts is more sure.

In the western portion the rainfall is so scanty that grazing is

the usual occupation and agriculture is carried on only by means of irrigation. The water for irrigation is secured largely from artesian wells; even the water for the cattle has to be secured in this way. Artesian wells are sunk to the underlying layers of rock which contain water, and the water either flows to the surface of its own pressure or it is pumped. The wind is so strong and so constant in this area, where the moving air is not impeded by any highlands, that windmills are commonly used for pumping water.

Forests are found in the highlands where the moisture is sufficiently great to furnish



FIG. 255. A typical farm scene in Indiana.

them the means of growth. In the northeast the principal trees are maples, birches, pine, spruce, hemlock, and beech, all of which furnish timber of value in building. The characteristic trees of the southern highlands are chestnut, ash, and hickory. The Indians of the plains formerly made annual trips to the great forests of the Black Hills to secure poles for their lodges, oftentimes traveling great distances in order to obtain them.

Outside of these regions few trees are found except along the water courses where the underground water is sufficient for their needs. Oftentimes in the western portion of the states a line of trees may be seen defining the course of a stream. Such a line is a sure sign of water at no great depth, even when none appears on the surface. During the early exploration of

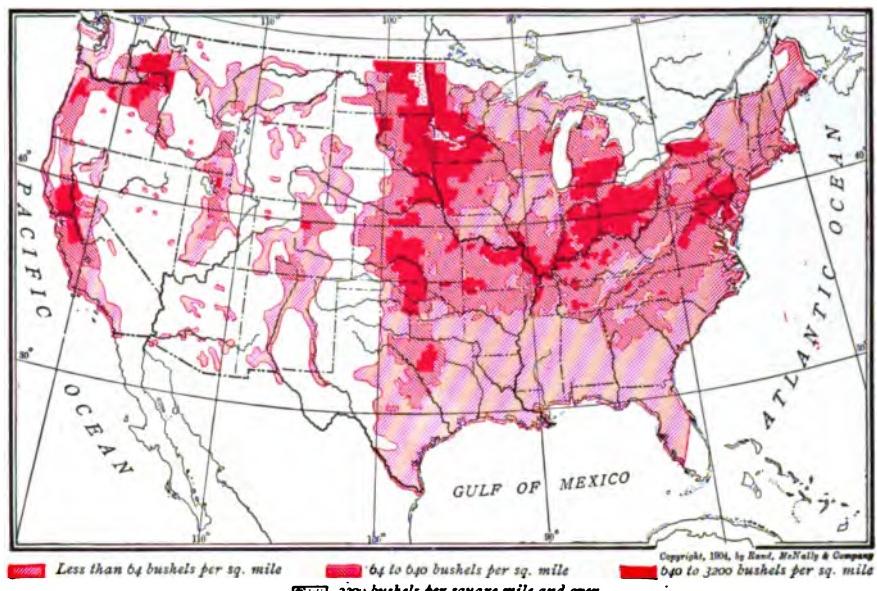


FIG. 256. The yield of wheat per square mile in the United States.

Nebraska are fifth and sixth in importance. Here natural conditions favor the raising of cereals. The spring comes early and the growing season is long. The summers are warm, sunshine abounds, and the soil is firm, so that it holds the roots of the stalks and permits them to be swayed by the wind without being blown over. In the wheat-growing states the whole area for miles in every direction seems like one great wheat field, broken occasionally by the farmhouses and farm buildings. (See Figs. 256 and 257.)

The slopes in the wheat area are so gentle that the crop may be planted and reaped by machinery. Hence the cost of production is not so great as in the eastern states, where the reaping of cereals has to be done largely by hand. The wheat is threshed by machinery and sent to the markets by rail.

At the larger cities the wheat is manufactured into flour or is transshipped to the East for local use or for shipment abroad. The principal shipping ports for wheat are *Duluth*, Minn., and *Chicago*, Ill., because of their excellent water connection to the East by means of the Great Lakes. *Minneapolis*, Minn., at the Falls of St. Anthony on the

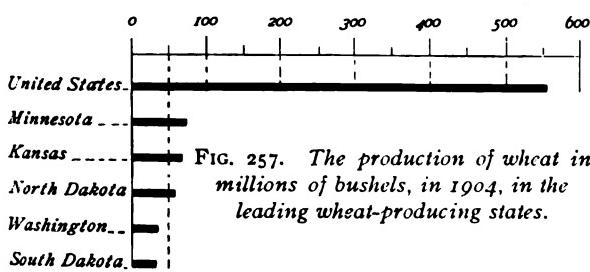


FIG. 257. The production of wheat in millions of bushels, in 1904, in the leading wheat-producing states.

the plains many people suffered severely from the lack of water when a few moments of digging in the sand would have furnished a supply.

Agriculture. Agriculture, and especially the raising of cereals, is the leading occupation of the Northern States of the Mississippi Basin. Wheat is the most valuable cereal, and in its production Minnesota, Kansas, and North Dakota lead the Union. South Dakota and



FIG. 258. *Duluth, the city at the head of the Great Lakes.*

Mississippi, is the greatest wheat-milling city in the world. Owing to its position near the wheat fields, and to its excellent railway connection with the region of production, and also to its natural water power, it early took front rank as a milling center. That position

southern portion of this region than in the northern. It also requires warm nights as well as days, and plenty of sunshine during the growing season. These conditions are all found in this group of states. The chief corn-producing states of the Union in the order of their importance are Illinois, Iowa, Nebraska, and Missouri, which with Indiana, Kansas, and Ohio, are often grouped together and called the corn belt. Much of the corn is used in the region as feed for hogs and cattle; some of it is made into hominy and breakfast foods, but nearly a quarter of the crop is shipped to the East for local use or for export. The larger portion of the corn bought in the feed stores in the East comes from this

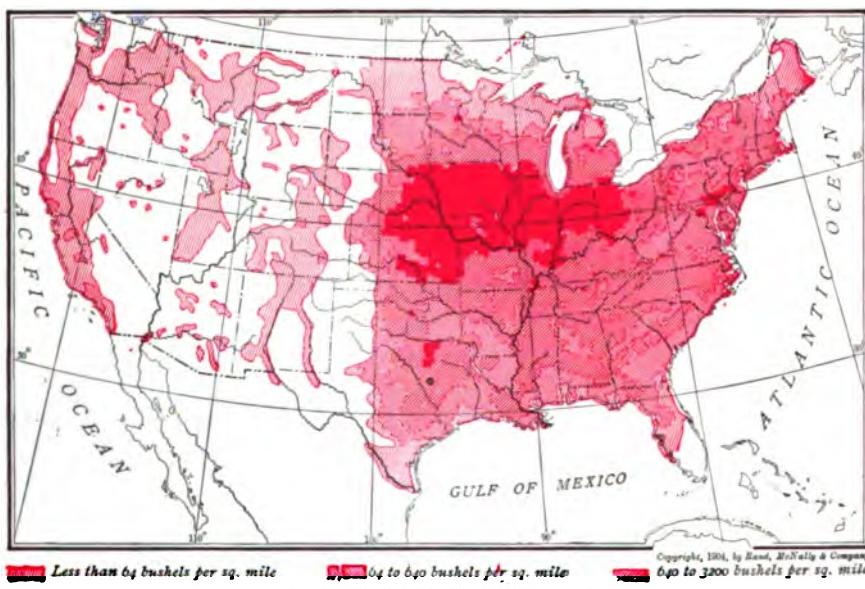


FIG. 259. *The yield of corn per square mile in the United States.*

it has maintained, though a large part of the milling is now done by steam power. Milwaukee, Wis., which is also near the wheat fields and has a more favorable position for shipping, is the third city in the country for wheat milling, while Chicago, Ill.; Toledo, Ohio, and St. Louis, Mo., follow it closely.

Corn, which is used mostly as a feed for cattle in other countries, is used also as food in this country and Mexico. It is produced in greater quantities than any other cereal in the Northern States of the Mississippi Basin. It requires more warmth than wheat, and is therefore grown more extensively in the

area, though much comes from the southern states.

Oats, barley, and rye are also important cereals in some of the states. Iowa and Illinois are the leading states in the Union in the production of oats. Minnesota leads the

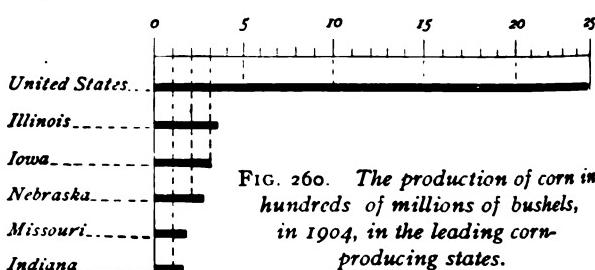


FIG. 260. *The production of corn in hundreds of millions of bushels, in 1904, in the leading corn-producing states.*

Union in the production of barley, and North Dakota, Wisconsin, and Iowa hold third, fourth, and fifth places. Wisconsin is the second and Nebraska the fourth state in the raising of rye.

Another crop of great commercial importance in these states is flax. Flax, which is raised in this country for the oil contained in its seeds, is

we have mentioned, however, for many other crops are of importance. Michigan is

the second state in the Union in the production of beets for sugar, the first in the raising of peas, and the first in the raising of beans. Michigan also furnishes more than sixty per cent of the oil of peppermint produced in the world.

In northern Ohio along Lake Erie, as in the portion of New York along Lake Ontario, the climatic conditions are favorable for the growing of grapes and small fruits. As

a result, the state of Ohio is third in the Union in the production of grapes and apples,

grown extensively in North Dakota, Minnesota, and South Dakota. North Dakota, in 1889, seventh among flax producing states, to-day leads with a crop that exceeds one-half of the total product of the country. In many parts of the world flax is also grown for the fiber it furnishes, but in our country very little is raised for this purpose.

Not all the agricultural land of the northern Mississippi Basin is devoted to the crops



FIG. 261. *A typical farm scene in Iowa.*

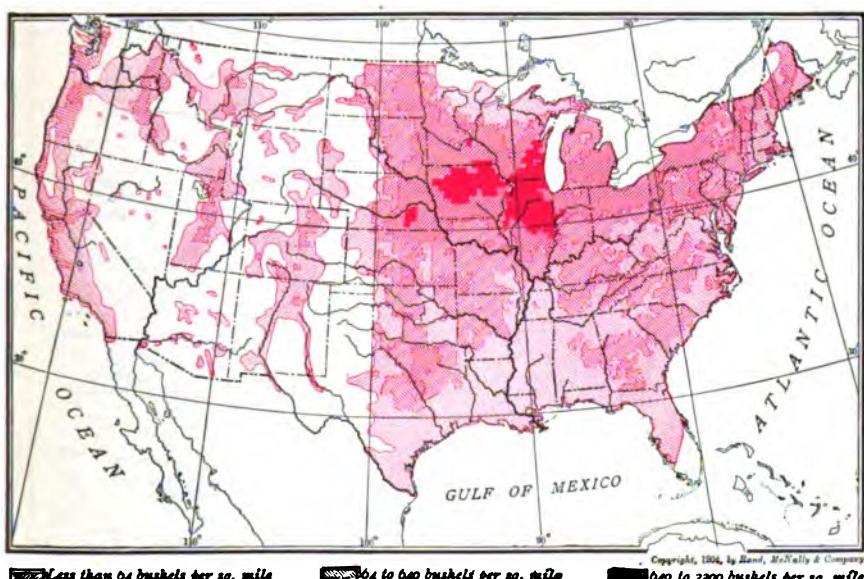


FIG. 262. *The yield of oats per square mile in the United States.*

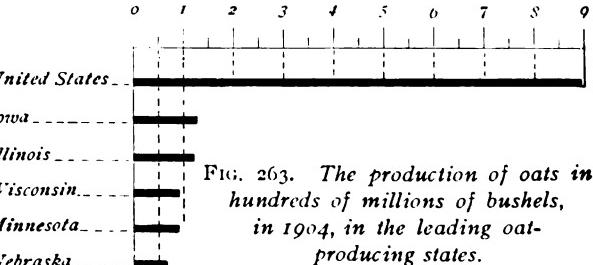


FIG. 263. *The production of oats in hundreds of millions of bushels, in 1904, in the leading oat-producing states.*

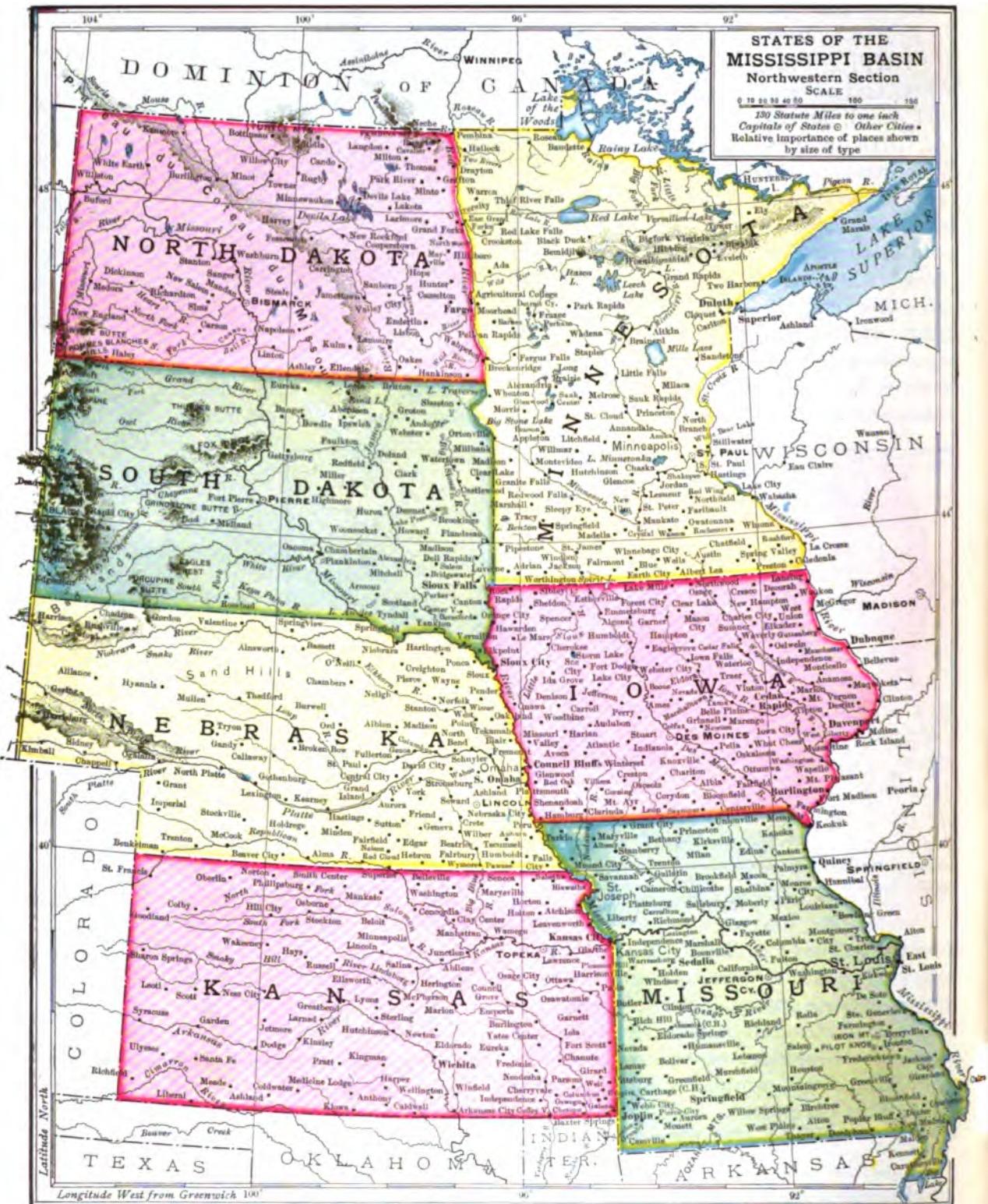


FIG. 364-

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and second in small fruits. Michigan, Illinois, and Indiana also have large apple crops, and likewise rank high among the leading states of the country in the production of grapes and small fruits.

Wisconsin and Ohio raise large amounts of tobacco, but are outranked by Kentucky, North Carolina, and Virginia.

Animals and Animal Products. Owing to the abundance of cereals raised, these states are of great importance for their cattle, horses, hogs, and sheep. In the western section the cattle are raised very largely on ranches, as they are to the south in Texas and Oklahoma. In the east they are usually raised on fenced farms. Next to Texas, the four



FIG. 266. *The stock yards at Chicago.*

Illinois and Iowa are the second and third states in the raising of horses, and Missouri raises more mules than any other state except Texas. Iowa, Illinois, Missouri, and Nebraska, owing to the great corn crop, raise more hogs than any other states.

Although great numbers of hogs, sheep, and cattle are sent to the eastern cities alive, and some are exported alive, by far the larger number are slaughtered in the meat-packing cities of *Chicago*, Ill., *Kansas City*, Kans., *South Omaha*, Nebr., *St. Joseph*, Mo., and *Indian-*

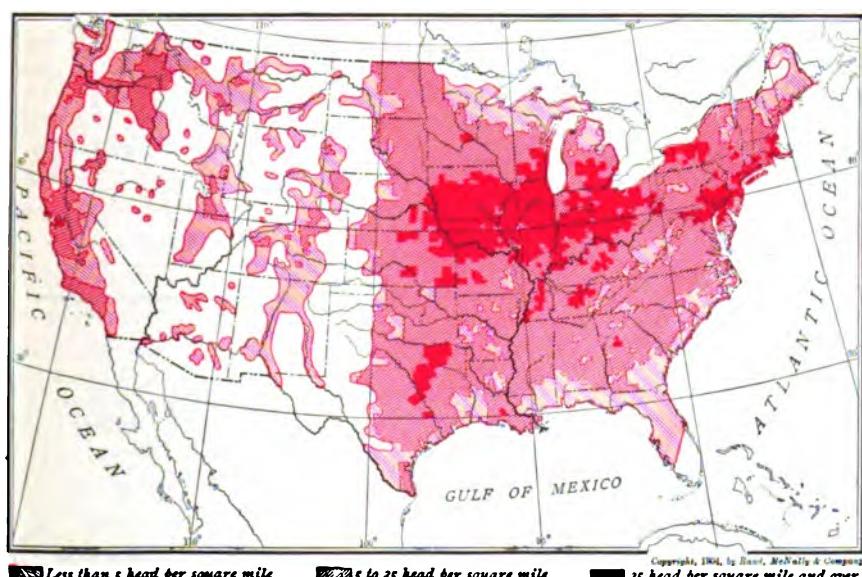


FIG. 265. *The number of horses and mules per square mile in the United States.*

states of Iowa, Kansas, Nebraska, and Illinois lead in cattle raising. Iowa ranks first in the Union in the production of butter, and Wisconsin is second in the production of cheese. These products are sent in great abundance to the eastern states for consumption there. Ohio and Michigan raise large numbers of sheep, and the wool produced in these states is of great importance in the woolen mills of the East.

apolis, Ind. The meat products can be readily shipped east for consumption or export since

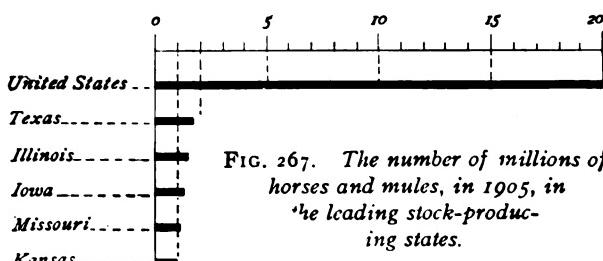


FIG. 267. *The number of millions of horses and mules, in 1905, in the leading stock-producing states.*

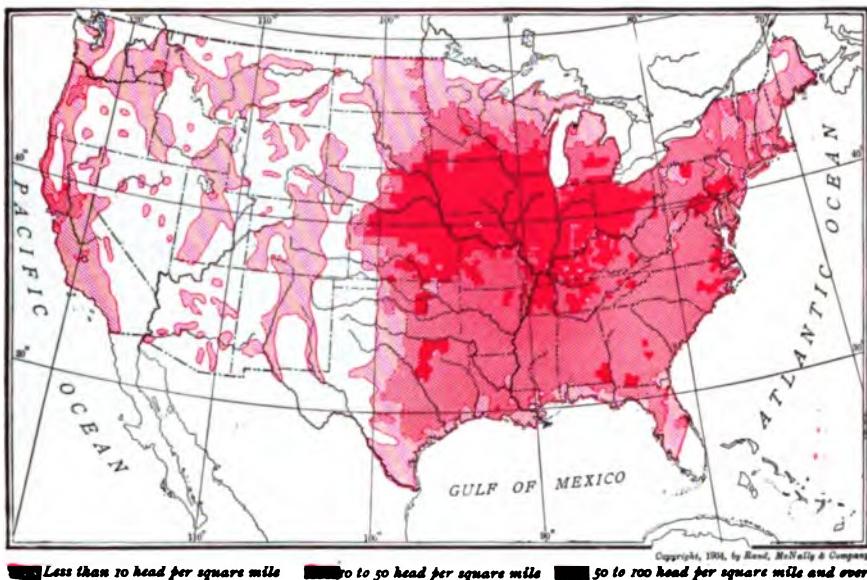


FIG. 268. The number of hogs per square mile in the United States.

the invention of the refrigerator car, which makes it possible to transport meat long distances without spoiling.

Forest Products. The United States furnishes more timber and lumber products than any other country. The most important states in the lumbering industry are Wisconsin, Michigan, and Minnesota. (See Figs. 273, 274, and 275.) A large portion of the lumber is shipped to planing mills. Much of it is made into sashes, doors, blinds, and boards, in the making of which *Chicago* is the second city in the Union. The hardwood is largely made into furniture at *Chicago* and at *Grand Rapids*, Mich., the second and third furniture-making cities of the country. In Wisconsin and Ohio the making of paper from wood pulp is also an important industry. The making of maple syrup is an important occupation in Ohio, this state producing more than any other.

Questions and Exercises

- (1) Name the states of this region. (2) What advantages do they possess in surface, soil, and position? (3) How do the states east of the Mississippi compare with those west in these advantages? (4) What difference in industries is found between the eastern part of this region

and the western? (5) In which section are artesian wells numerous? Why? (6) What is an artesian well? (7) Which part of this area is practically treeless? (8) Compare methods of farming in this region with those in New England. (9) Why should Minneapolis be a big milling city and Duluth and Chicago wheat-exporting cities? (10) Describe how the lake steamers at Duluth and Chicago are loaded with wheat. (11) Where must the wheat destined for Europe be reshipped? (12) What influence has this had upon the growth of towns? (13) Make a

list of the chief uses of corn. (14) What states of this region are in the corn belt? (15) What makes the climate of Ohio and New York mild enough to ripen grapes? (16) What states of this region are in the wheat belt? (17) What states of this region produce iron?

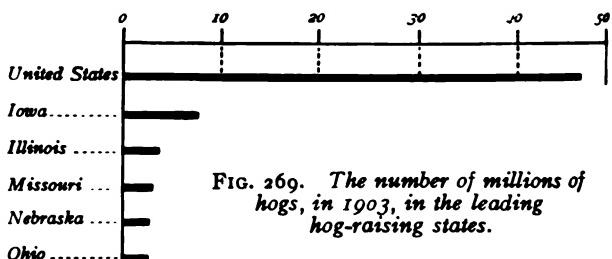


FIG. 269. The number of millions of hogs, in 1903, in the leading hog-raising states.

XXXIV. NORTHERN STATES OF THE MISSISSIPPI BASIN (Continued)

Mineral Products. The Northern States of the Mississippi Basin are extremely rich in mineral products, especially in coal, natural gas, petroleum, iron, copper, lead, zinc, gold, and building stones. (See Figs. 221 and 227.) Nearly three-fourths of the iron produced in the country comes from the Lake Superior region. Minnesota and Michigan are the two leading iron-producing

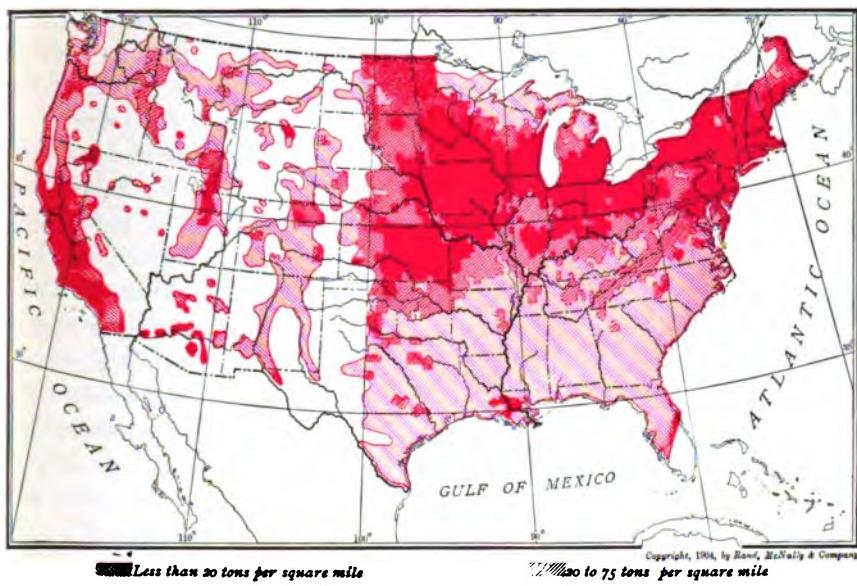


FIG. 270. *The production of hay and forage per square mile in the United States*

states. In some cases the ore lies deep underground and has to be mined like any other mineral. In other cases, as in certain parts of Minnesota and Michigan, it lies on the surface and can be loaded directly into cars by means of steam shovels. This makes the mining cheap and easy. (See Fig. 287.)

Coal of the kind to make coke, which is used in the smelting of iron, is not abundant near these iron fields. Hence the ore is sent to the large iron-making cities of the East for manufacture. *Duluth* and *Two Harbors*, Minn., *Ashland* and *Superior*, Wis., *Escanaba* and *Marquette*, Mich., because of their position on the lakes and nearness to the ore fields, are the leading ore-shipping cities. Most of the product is transported east to other lake ports near the steel-making cities of *Ashta-*

pays to mine it, even though the expense is great. In late years the use of copper has greatly increased, owing to the development of electricity. The best telephone and telegraph wires are made of copper, and copper is used in the arts in many ways.



FIG. 272. *Stacking hay in Missouri.*

Coal is generally distributed throughout this group of states. The coal is all bituminous, however, and not so valuable as the hard coals of Pennsylvania. Illinois, West Virginia, and Ohio are, next to Pennsylvania, the chief coal-producing states of the Union. (See Figs. 221 and 222.) In West Virginia much of the coal is made into coke for the iron and steel mills.

The eastern states of this group are important for their supplies of petroleum and

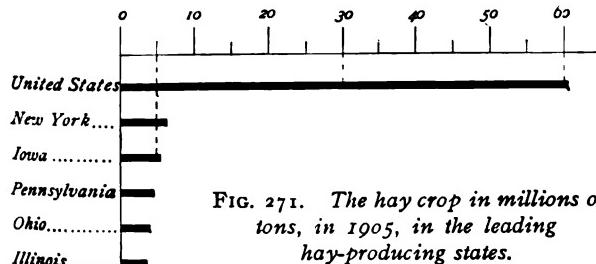


FIG. 271. *The hay crop in millions of tons, in 1905, in the leading hay-producing states.*

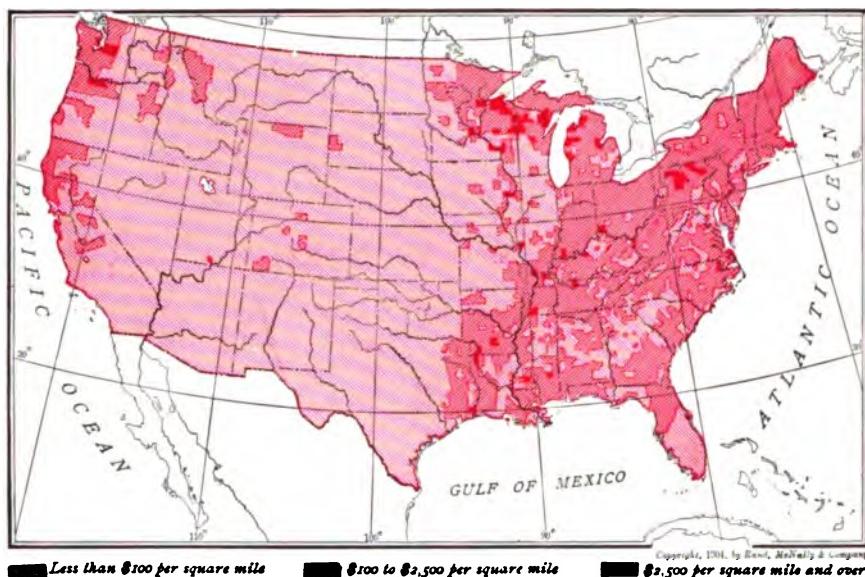


FIG. 273. The value of lumber and timber products per square mile in the United States.

natural gas. Ohio and West Virginia are the leading states of the group in the production of petroleum, and Indiana and West Virginia are the first in natural gas. These fields are a continuation of the fields found in Pennsylvania and New York. (See Fig. 227.) The petroleum is largely sent to eastern cities, where it is refined for the world's trade, in which the United States leads. The oil is sent across the country by means of pipes, thereby saving the cost of transportation by rail. It is distributed to the refineries in the same way that water in large cities and many towns is distributed to the houses. Natural gas, in the regions where it is found, is largely used for illuminating and for fuel, not only in the houses but also in the factories. The supply of natural gas is not so abundant as that of oil. In fact, natural gas has given out

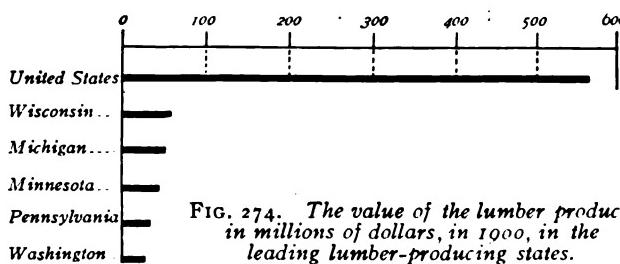


FIG. 274. The value of the lumber product in millions of dollars, in 1900, in the leading lumber-producing states.

in some places, so that a few cities have been obliged to return to the use of coal as fuel.

Another rock product of value in these states is clay. It is found in several states, but is of special value in Ohio, where a superior variety used in making pottery occurs. Terra cotta, fire clay, and pottery are important products about Zanesville and East Liverpool, Ohio. Building stones are found in several of the

states, especially in Indiana, which produces a fine limestone. Kansas, Missouri, and Ill-



FIG. 275. A paper mill in Minnesota beside a river filled with logs.

inois together produce the largest part of the zinc used in the United States, and these states together with Wisconsin are important for their lead ores.

Manufacturing. Besides the manufactures associated with the animal products and lumber, already mentioned, this group of states has such a wealth of other finished products that Illinois is the third and Ohio the fifth manufacturing state in the Union. (See Fig. 233.) The value of the manufac-

tures of this group of states as a whole, however, is second to that of the Middle States of the Atlantic Coast. The success of manufacturing is due largely to the nearness of the raw materials, to the easily accessi-

ble fuels, and to the excellent facilities for trade which these states enjoy. Owing to the position that agriculture holds in this group of states, Illinois and Ohio lead in the production of agricultural implements. Illinois and Michigan lead in the making of railroad cars, and Ohio and Indiana in the making of carriages.

Trade and Cities. The states of this group have admirable facilities for sending their products to market. The Great Lakes furnish the finest system of interior waterways in the world, and are available for commerce from about the first of April to the first of December. Hence the cities about the lakes have increased in size and importance at a phenomenal rate. The completion of a canal about the rapids of St. Mary's River has made it possible for the iron, the copper, and the wheat from the Lake Superior region to be shipped to Buffalo without transhipment of cargoes.

The Mississippi system, with its many thousands of miles of navigable streams



FIG. 276. Looking toward the Illinois Steel Works, South Chicago.

penetrating the whole region, offers another great water route leading toward the southern ports. Practically all the large cities of the region have therefore grown up along the lakes or the rivers of

the Mississippi Basin. The long stretches of nearly level land where the slopes are gentle have favored the development of railways, so that this area is covered with a network of roads, especially in the eastern part, where the products to be sent to market are most valuable. In many of the states the railroads have been paralleled in recent years by electric roads, so that the farmers have unusual facilities for shipping their products.

Chicago, Ill., is the chief city of the Northern States of the Mississippi Basin, and the second city in size in the Union. It is located at the southern end of Lake Michigan, and because of the unusually favorable opportunities presented for manufacturing and trade, its growth has been phenomenal. It is the nearest large city to the corn-growing area, and is within reach of the lumber, coal, and iron regions. All railroads from the Northwest as well as many from the East center at this point, as all goods shipped by land between these regions must go around the lake. Chicago also



FIG. 277. Along the water front, St. Louis.

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has ready rail communication with the cities of the Southern States of the Mississippi Basin. It is the greatest railway center in the world.

When the great Chicago Drainage Canal, which connects the city with the Illinois River, is opened for navigation purposes, Chicago will have a water route available for large vessels connecting it with the Mississippi River and the Gulf of Mexico.

Because of all these natural advantages dependent on its location, Chicago has developed in less than a century from a small frontier fort to its present position as the second city of the country in population and manufactures and the fifth largest city in the world. It is the first city in the slaughtering of cattle and hogs, and in the production of agricultural implements. It is second in the making of ready-made clothing, and third in the production of steel and iron goods. (See Fig. 276.) It also has many other manufacturing industries of great value, and is the financial center of this group of states, as New York is of the eastern states.

Chicago is also an interesting city because of its large educational institutions, museums, and high buildings. It is regularly laid out on the level prairies; and contains many beautiful parks and avenues.

St. Louis, Mo., the fourth city of the Union, is important for its production of flour, meat products, iron and steel, finished tobacco, and malt liquors. Owing to its position on the Mississippi and close to the mouth of the Missouri, it has excellent facilities for water trade. It has fine railway facilities; the famous Ead's Bridge across the Mississippi is 2,225 feet long, and the Union Railway Station covers eleven acres of ground. (See Fig. 277.)

Milwaukee, Wis., from its position on Lake Michigan, is also favorably located for manufacturing and for carrying on an extensive trade. It is important for its manufactures of foundry products, leather, and malt liquors.

Minneapolis and *St. Paul*, Minn., called the "Twin Cities," at the head of navigation of the Mississippi, because of their position near the wheat fields and the lumber forests, have grown and developed rapidly. Minneapolis is the largest flour-milling center in the world. (See Fig. 281.)

Detroit, Mich., from its position on the river connecting Lake Huron and Lake Erie, is an enterprising railroad center and lake port. It is important for its manufacturing of cars and for its shipping of grain, pork, and ores.

Cleveland, Ohio, on Lake Erie, is the leading shipping point in the state. It is busily engaged in iron and steel manufacturing, oil refining, and shipbuilding. *Cincinnati*, Ohio, the largest city in the Ohio Valley, and *Wheeling* and *Parkersburg*, W. Va., farther up the same river, are manufacturing centers.

Indianapolis, Ind., is a thriving manufacturing place and an active railway center.

The western group of these states, owing



FIG. 278. Docks and elevators at Duluth.



FIG. 279. Along the Lake Front, Chicago.

to the prevailing occupations, agriculture and grazing, has a scattered population and few large cities except along the Missouri River. The principal ones are those that have developed as railroad centers for the region round-about. The larger are *Kansas City*, Mo.; *Omaha*, Nebr., and *St. Joseph*, Mo., all important markets for cattle, sheep, and horses. Many portions of these states, however, are far removed from railroads, which do not form a network over the country as they do in the eastern section. The principal roads are the great transcontinental lines running east and west between the eastern cities and the cities of the Plateau States.



FIG. 280. Looking down into the midst of Chicago.



FIG. 281. Looking toward the flour-milling district in Minneapolis.

Questions and Exercises

- (1) Name the great cattle-raising states.
- (2) Trace the route by which the wool from Wisconsin gets to Massachusetts. (3) Locate the large meat-packing cities, and trace the route by which Kansas City beef gets to Philadelphia. (4) Give one reason why Grand Rapids should manufacture furniture; Wisconsin, wood pulp. (5) What are the great iron-shipping cities? (6) Trace the route by which iron from Duluth reaches Pittsburg. (7) Draw a map of the Great Lakes, and locate on it the chief commercial cities. (8) State the importance of the rapids at the "Soo." (9) Compare the importance of the "Soo" and the Suez canals. (10) Draw a diagram showing the chief advantages of the location of Chicago. (11) Draw the chief lines of railroad which center in this city. (12) Tell about its growth.

XXXV. THE PLATEAU STATES

STATE	Abbreviation	Area in sq. miles	Population 1900	Chief City	Population 1900	Capital
Montana.....	Mont...	146,080	243,329	Butte.....	30,470	Helena
Wyoming.....	Wyo...	97,890	92,531	Cheyenne.....	14,087	Cheyenne
Colorado.....	Colo...	103,925	539,700	Denver.....	133,850	Denver
New Mexico (Ter.)....	N. Mex.	113,020	195,310	Albuquerque..	6,238	Santa Fe
Arizona (Ter.).....	Ariz....	112,920	122,931	Tucson.....	7,531	Phoenix
Nevada.....	Nev....	110,700	42,335	Reno.....	4,500	Carson City
Utah.....	Utah...	84,970	276,749	Salt Lake City.	53,531	Salt Lake City
Idaho.....	Idaho..	84,800	161,772	Boise	5,957	Boise

Surface and Climate. The surface of the Plateau States is extremely rugged, except to the east of the Rocky Mountains and in

parts of the Great Basin, where the slopes are, in places, gentle, though the elevation is high. The climate is dry, except in the higher

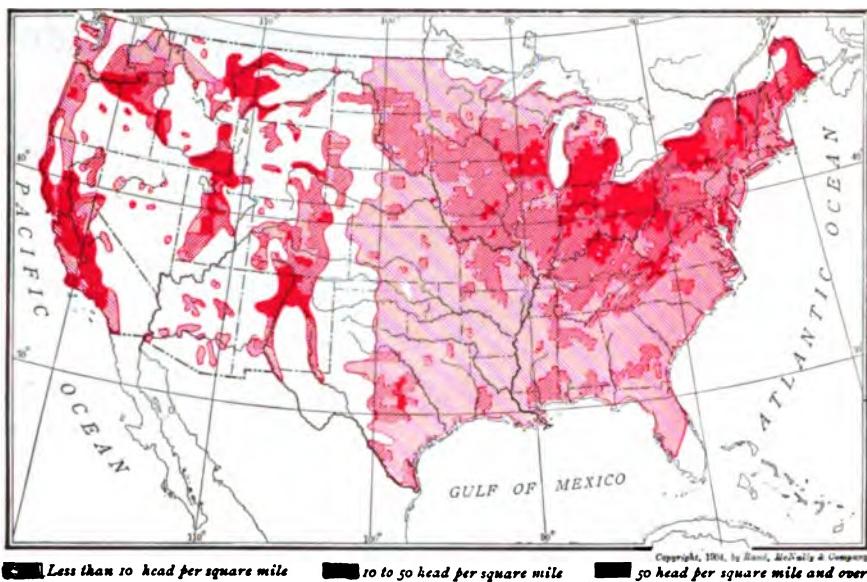


FIG. 282. *The number of sheep per square mile in the United States.*

mountains, where there is enough moisture for the growth in trees. As a result, the occupations in the Plateau States are largely grazing and mining. The population is consequently scattered, being mostly centered about the mining towns and in a few large cities in the lower regions, which have developed because they are favorably situated for trade. The population of this whole group of states is about the same as that of the city of Chicago.

The scenery is everywhere grand and impressive (See Fig. 175), but there are enormous areas in the highlands that are little known, and undeveloped because they contain no valuable products except lumber. Owing to the distance from the markets and the consequent cost of transportation, the forests have been of little value thus far. Many of the mountain regions and the hills at the foot of the mountains have become famous as health and pleasure resorts, owing to

Northern States of the Mississippi Basin.

Grazing. The principal form of grazing is the raising of sheep, though cattle are raised in large numbers in certain parts of some of the

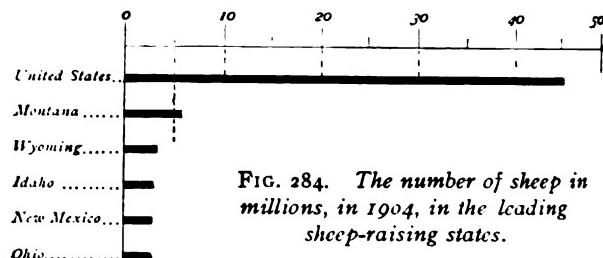


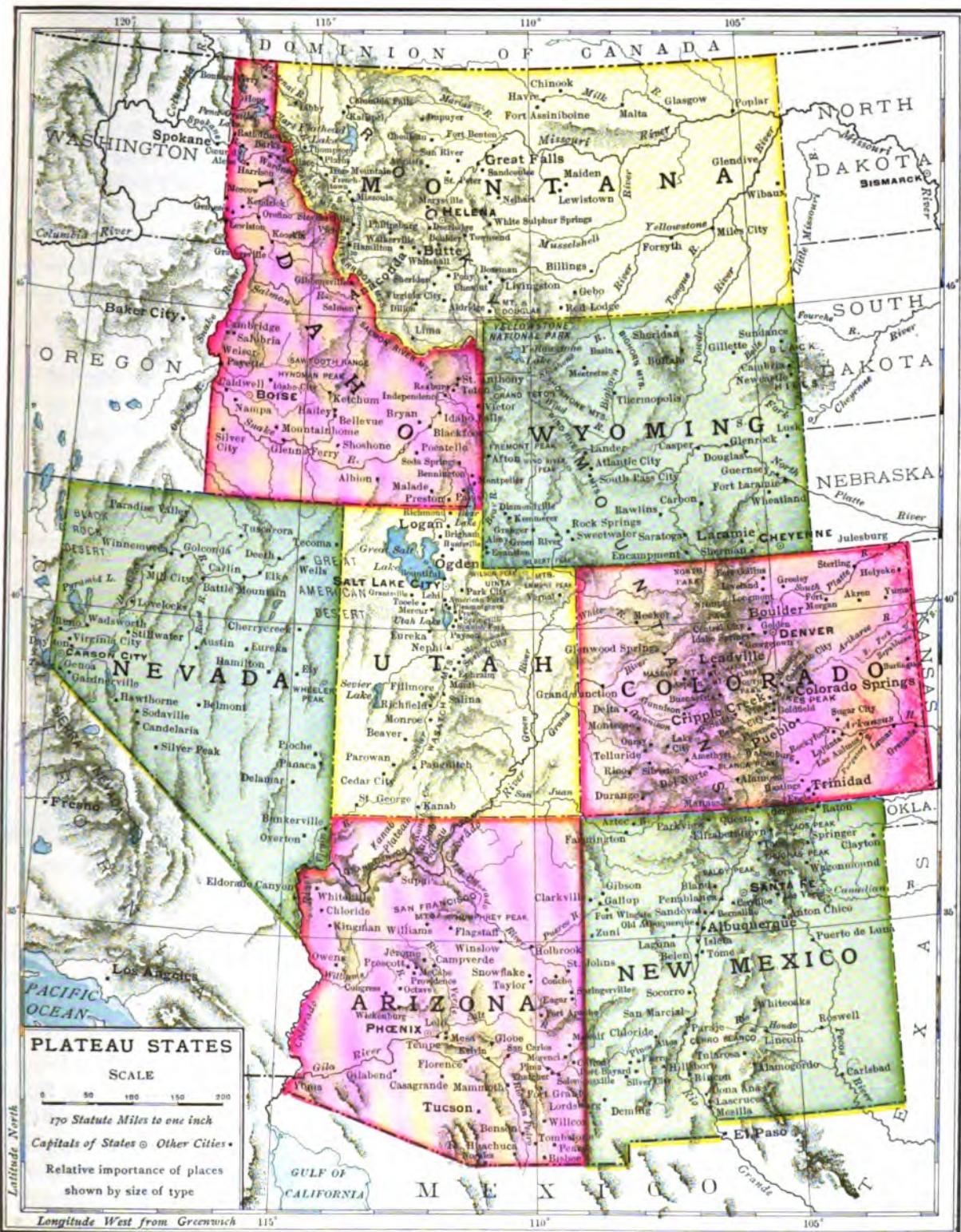
FIG. 284. *The number of sheep in millions, in 1904, in the leading sheep-raising states.*

states. Montana, Wyoming, and Idaho lead all the states in the Union in the number of sheep raised, and Montana and Wyoming are also the two leading states in the production of wool. New Mexico and Utah are

also important for their sheep industry. As sheep eat clean wherever they go, they have done great damage to the young and tender trees in the forests. As a result, grazing in the forests is now being restricted.



FIG. 283. *A scene on a sheep ranch in the grazing region of Montana.*



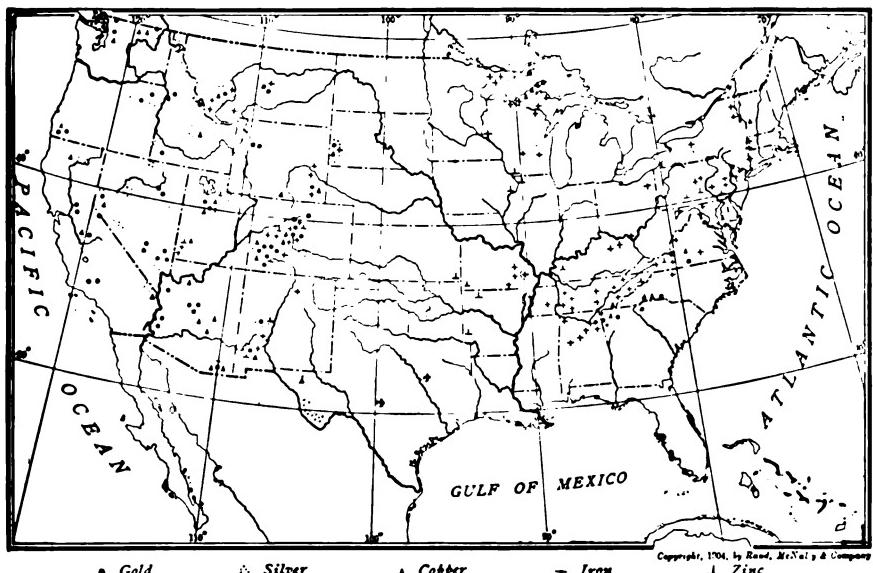


FIG. 286. *The leading centers of production of gold, silver, copper, iron, and zinc.*

Mining. The strong rocks that make up the mountain masses contain abundant supplies of valuable minerals, of which the most important are gold, silver, and copper. Colorado is the first state in the production of both gold and silver, and Montana, Utah, and Idaho are, next to Colorado, the leading silver-producing states. Thus practically all the silver of the country is secured from the Plateau States. Montana is the first state in the production of copper. The copper mines at *Butte* are the richest and the best developed in the world. Arizona is the third copper-producing state.

Lead, which is usually found in association with the silver, is also an important mineral. Idaho, Utah, and Colorado lead in its production. Coal is found in nearly all the states, but is little mined except in Colorado, where it is largely used in making coke.

The great value of the ores has made the smelting of gold and silver of great importance at many places. *Denver* and *Pueblo*,

Colo., are the leading smelting cities, though *Leadville*, Colo., at an altitude of over ten thousand feet, is important in this industry. *Cripple Creek* and *Leadville* are the best known of the large mining towns, though there are many smaller ones scattered throughout the mountains. The towns are usually located on the lower slopes of the valleys, the openings to the mines dotting the hillsides. (See Fig. 286.)

Trade Routes and Cities. The principal railroads that cross the Plateau States are por-



FIG. 288. *The copper mines near Butte, Montana.*

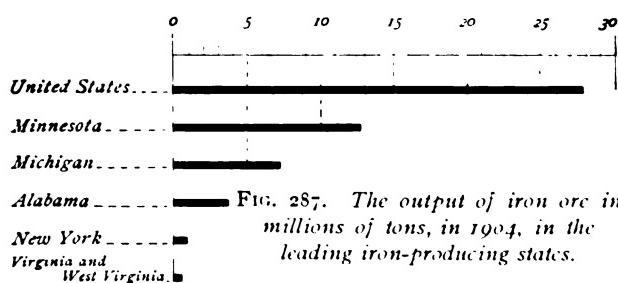


FIG. 287. *The output of iron ore in millions of tons, in 1904, in the leading iron-producing states.*

tions of the great transcontinental lines. Many of the mountain passes are occupied by railroads, some of which cross the mountains at an altitude of over ten thousand feet. A great circle of railroads starting from Denver connects the mining towns of southern Colorado. Branch roads connect the main lines with the mining towns in the smaller valleys, so

that the railroads are of importance not only as routes for through freight, but also for their supplies of ore which they bring to the larger cities for smelting.

Owing to the fact that the commerce between the different states of this region is small, there is but one railroad running north and south. This route extends from *Butte*, Mont., southward to Utah, but it is not so important as the lines connecting the East with the States of the Pacific Coast. A new road across the deserts from *Salt Lake City*, Utah, to *Los Angeles*, Cal., is now completed, and gives another outlet to the East for the products of southern California.

The larger cities of this group of states are distributing centers for the mining towns, receiving the ores and sending in return necessities in the way of mining supplies and food. The chief city of this group of states is *Denver*, Colo., situated at the eastern foot of the Rocky Mountains and having excellent railroad connections with the East.

It is an important railway center. Within a few miles are *Pueblo*, Colo., a smelting city, and *Colorado Springs*, Colo., a noted health and scenic resort. Arizona and New Mexico contain no large cities. *Santa Fe*, in New Mexico, an interesting old Spanish town, is the oldest city in

the United States, though it has not been occupied by white people so long as *St. Augustine*, Fla. *Phænix* and *Tucson*, Ariz.,

towns of some size, are largely dependent upon their mining.

To the east of Great Salt Lake, in a fine climate and in the midst of rich irrigated districts, are situated *Salt Lake City*, *Ogden*, and *Provo*, Utah. These cities are favored by their position upon transcontinental lines of railroads, and are growing rapidly. *Salt Lake City* is the home of the Mormon church and contains its Temple and its Tabernacle. Both of these buildings are very impressive

and are of much interest to travelers.

Nevada is but thinly populated and contains no large towns. *Virginia City* and *Carson City* were formerly important, owing to the productiveness of the neighboring silver mines. These mines have yielded less in recent years, and the cities have therefore lost a large part of their population.

Indians. The Plateau States contain a large number of Indians, the last of the powerful tribes who possessed the country before the coming of the white men. They are unlike the Indians of former years, however, as they are no longer chiefly dependent upon the chase for their living. Some of them practice agriculture, and many of them have large flocks of sheep and small donkeys called burros. Many Indians secure a very good living from the region in which they dwell, and live in respectable homes. Certain tribes are noted for the weaving of baskets, rugs, and blankets.



FIG. 289. *Cripple Creek, Colorado.*



FIG. 290. *An irrigated orchard in Utah.*

In New Mexico there are many tribes of Indians who live in large towns composed of flat-roofed houses, built of sun-dried bricks made from the clay of the region. (See Fig. 88.) These villages, situated upon the hilltops, are extremely interesting and picturesque objects. Centuries ago great numbers of primitive people lived here in similar villages or *pueblos*, or in houses built in the recesses under cliffs. They have all disappeared, however, and to-day the only knowledge that we have of them and their manner of living is what we learn from the ruins of their houses and the implements and tools they have left behind them in their homes.



FIG. 291. *An Indian woman weaving a basket in Arizona.*

Questions and Exercises

(1) Which state in this section is the largest? The smallest? (2) Which state is most densely populated? (3) Where is the population in this state chiefly centered? Why?

(4) What is the rainfall of these states? (5) How do you account for the large rivers that cross this region and the Great Plains? (6) Name the rivers that rise in the Plateau section and flow to the east. (7) What rivers do not flow out of this section? Give the reason. (8) Why are the grazing areas so thinly peopled? (9) To what cities are the sheep and cattle of this section sent to be slaughtered?

(10) Study the product maps and be able to locate on a blank map the chief products of this section. (11) State the importance of the location of Pueblo and tell why the town is a growing one. (12) What railroad facilities has it? (13) Why is Denver a railroad center?

XXXVI. THE STATES OF THE PACIFIC COAST

STATE	Abbreviation	Area in sq. miles	Population 1900	Chief City	Population 1900	Capital
Washington.....	Wash..	69,180	518,103	Seattle.....	80,671	Olympia
Oregon.....	Ore....	96,030	413,536	Portland.....	90,426	Salem
California.....	Cal....	158,360	1,485,053	San Francisco.	342,782	Sacramento

The States of the Pacific Coast are everywhere mountainous, except in the large river valleys and on the small lowlands that border the Pacific in the southern part of California. The mountains are building so rapidly that in portions of this region earthquakes are frequent. In



FIG. 292. *Hydraulic mining in California.*

1906 a severe earthquake caused a great destruction of property and lives in San Francisco and the immediate vicinity. Mining, lumbering, and agriculture are the leading occupations of the people.

Mining. Mining is at present practically confined to California, next to

Colorado, the leading gold-producing state. In 1849 gold was found in the gravels of the valleys on the western side of the Sierra Nevada. People flocked to the diggings from all parts of the Union and in a few months cities of considerable size grew up. As the returns from gold mining decreased, the people turned their

attention to other means of living, and began to develop the lumbering and agriculture in

beauty, but in several groves they are being ruthlessly destroyed for their lumber. The

the region.

Lumbering. Except for the cutting of the Big Trees and the redwoods in California, lumbering is largely confined to the two northern states. It is of most importance in Washington, fifth in the Union in the value of its forest products. The great fir trees, many more than two hundred feet high, furnish much valuable timber which is sent to the larger towns, where it is prepared for market. *Tacoma* and

Seattle, Wash., have many large sawmills and are the leading lumber towns of the West.

redwoods furnish a very beautiful wood for interior decoration. (See Fig. 293.)

Agriculture. Certain forms of agriculture are very important in Washington, Oregon, and California. The dry valleys of these states and the eastern plateaus of Washington are well adapted to the growth of wheat and barley. California is the second state in the production of barley.

The most important crop of the States



FIG. 293. *Big Trees of California.*

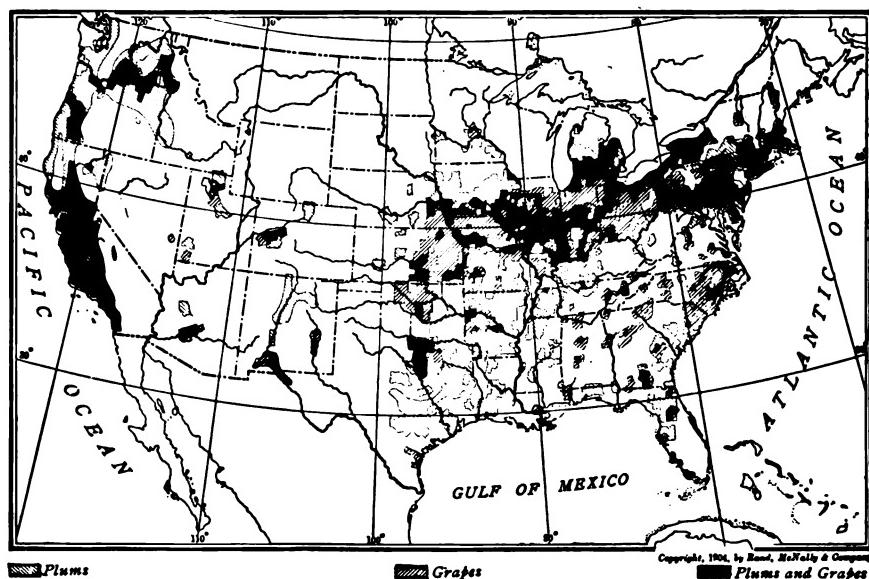


FIG. 294. *The areas of production of grapes and plums in the United States.*

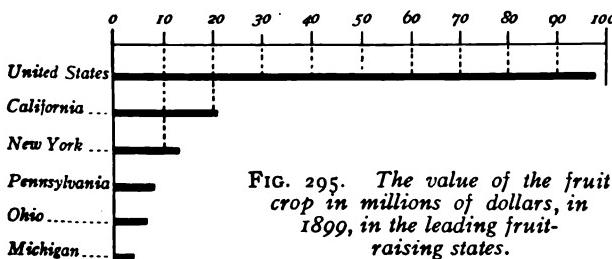


FIG. 295. *The value of the fruit crop in millions of dollars, in 1899, in the leading fruit-raising states.*



FIG. 296.

of the Pacific Coast, however, is the fruit. Owing to the subtropical climate of southern California and to the abundant sunshine and even temperature, all varieties of temperate and subtropical fruits are raised in large quantities. The success of the fruits depends largely upon the employment of irrigation, for which the near-by mountain streams furnish an abundance of water. The water is taken from the streams as they emerge from the mountains and is distributed over the lands in a series of branching channels, very much like those of a delta, though of course much smaller.

California is the first state in the Union in the production of temperate-climate fruits like peaches, plums, prunes, pears, apricots, and grapes. A large part of the grapes is made into wine and raisins. California leads the Union in these industries. It is also first in the raising of all kinds of subtropical fruits, except bananas and pineapples, which are not found here. It raises nearly twenty times as many oranges as Florida, practically all the lemons and olives, and a large share of the figs grown in the United States. It also

raises nearly all the almonds and English walnuts grown in the country.

Some of the temperate fruits and a large part of the oranges are shipped to eastern markets fresh. A great quantity, especially of peaches, pears, and prunes, however, is canned or preserved. California is the leading fruit-preserving state in the Union.

Fishing. The rivers of the northwestern coast provide favorite spawning grounds for salmon, and therefore the catching and the curing of this fish are important industries in Washington and Oregon. Washington is the first state in the country in fish canning, and Oregon ranks fifth. The canning industry is not so important, however, in either of these states as it is farther north in Alaska.

Manufacturing. Except for the canning and preserving of fruits, vegetables, and fish, the preparation of lumber, and the making of wine, there is little manufacturing of importance in any of the States of the Pacific Coast. A large amount of sugar is refined at San Francisco and other near by



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cities, as at Stockton, Cal. The raw sugar is mostly imported from Hawaii.

Cities and Trade.

Owing to the regular form of the coast, the harbors are few and far apart along the whole length of these three states. The principal harbors are those of the two great inlets, San Francisco Bay and Puget Sound, and the harbor of San Pedro which has been improved by the Govern-

ment at large expense. Each of the cities which have developed on these inlets has transcontinental connection with the producing and consuming areas of the East, and through them pass the exports to the Far East.

San Francisco, Cal., which is connected with the eastern cities by several routes and which has the best harbor, has one of the most favorable situations on the Pacific coast. Its commerce with the Old World has grown rapidly since the United States came in possession of Hawaii and the Philippines. The business portion of the city is situated on a low plain bordering the bay, while the res-



FIG. 297. Unloading salmon on the banks of the Columbia River.



FIG. 298. Along the water front at San Francisco.

idence portion is located on the hills between the bay and the ocean. One section of the city is populated almost entirely by Chinese. In 1906 the business area and part of the residence section were almost destroyed by a great earthquake and fire. The city is being rebuilt and no doubt will soon again be one of the great business centers of the country.

Across the Bay of San Francisco, where the climate is a little less damp than it is in the city itself, have grown up several residence suburbs. The most important of these are *Oakland* and *Berkeley*, the seat of the University of California, one of the leading universities of the country. The growth of cities on the eastern side of the bay will probably continue, as the railroads from the east all terminate on that side of the bay, with the exception of one road, which enters San Francisco from the south.

Sacramento, the capital of the state, and *Stockton*, both connected with San Francisco by navigable rivers, are active and growing towns. *Los Angeles*, in the southern part of the state and at the center of the subtropical fruit-growing area, has developed with great rapidity in the last few years, owing in part to the increase in the fruit industry and in part to the fact that the climate of this region is warm and dry, and therefore much liked by many people.

Portland, the port of Oregon, is the chief city of that state. It has a growing commerce and is important locally for its manufactures. The leading cities of Washington are *Tacoma* and *Seattle*, both ports of increasing importance, and *Spokane*, a manufacturing center in the eastern part of the

state, situated near waterfalls which furnish excellent power. Seattle is the principal port for the Alaskan trade, and Portland has an important coastwise commerce.

Questions and Exercises

(1) On which side of the mountains are the forests heavier? Why? (2) Why are the two northern states more densely wooded than California? (3) Why is not the southern part of California so heavily forested as the northern part of the state? (4) Where is the great wheat-producing area of this section? (5) Why is Spokane called the "Minneapolis of the West"? (6) What conditions of climate make fruit growing profitable? (7) What climatic conditions are unfavorable to such growth?

(8) Why are San Francisco Bay and Puget Sound so important to the Pacific Coast? (9) Draw a large map showing the location of San Francisco and surrounding towns. (10) Of what valley is it the outlet? (11) What features of location similar to New York has San Francisco? (12) What interesting sights does the city afford? (13) How is a California farm irrigated?



FIG. 300. An irrigated fruit farm in southern California.

XXXVII. THE DEPENDENCIES OF THE UNITED STATES

The United States possesses several dependencies in different parts of the world, and a few small islands in the Pacific. The territories of *Alaska*, *Hawaii*, and *Porto Rico* are of great value to the home country because of their products, but the small islands are of little value except as cable and coaling stations in the great Pacific Ocean.

ALASKA

Alaska was bought from Russia in 1867. It extends from the Queen Charlotte Islands to the end of the Aleutian chain, and has an area more than twice as great as the

state of Texas. The population, which is made up largely of Indians, is over sixty thousand.

Surface. The surface of Alaska is mostly mountainous. The Cordilleran Highland grows narrower here than it is to the south, but contains many extremely high peaks, of which *Mount McKinley* is the highest and *Mount St. Elias* the best known. Many of the peaks of the Aleutian chain of islands are volcanic, but are practically inactive. The northern coast of Alaska is lower than the southern, but owing to its Arctic location large areas are almost unknown. The coast is very irregular and in the south is indented by a magnificent series of fiords, in which salmon abound.

Drainage. Alaska contains several large rivers, of which the greatest, the *Yukon*, extends across the whole area. The *Yukon* is one of the large rivers of the continent and is an important highway for summer trade. The lands of the lower valley have so favorable a climate that they can be devoted to the raising of the more hardy cereals and vegetables. Agriculture is developing here. The principal towns of the valley are found along the eastern boundary of the territory near the cities of northwestern Canada, all of which are due to the discovery of gold in the Klondike region a few years ago.



FIG. 301. *Mount McKinley, the highest mountain in North America.*

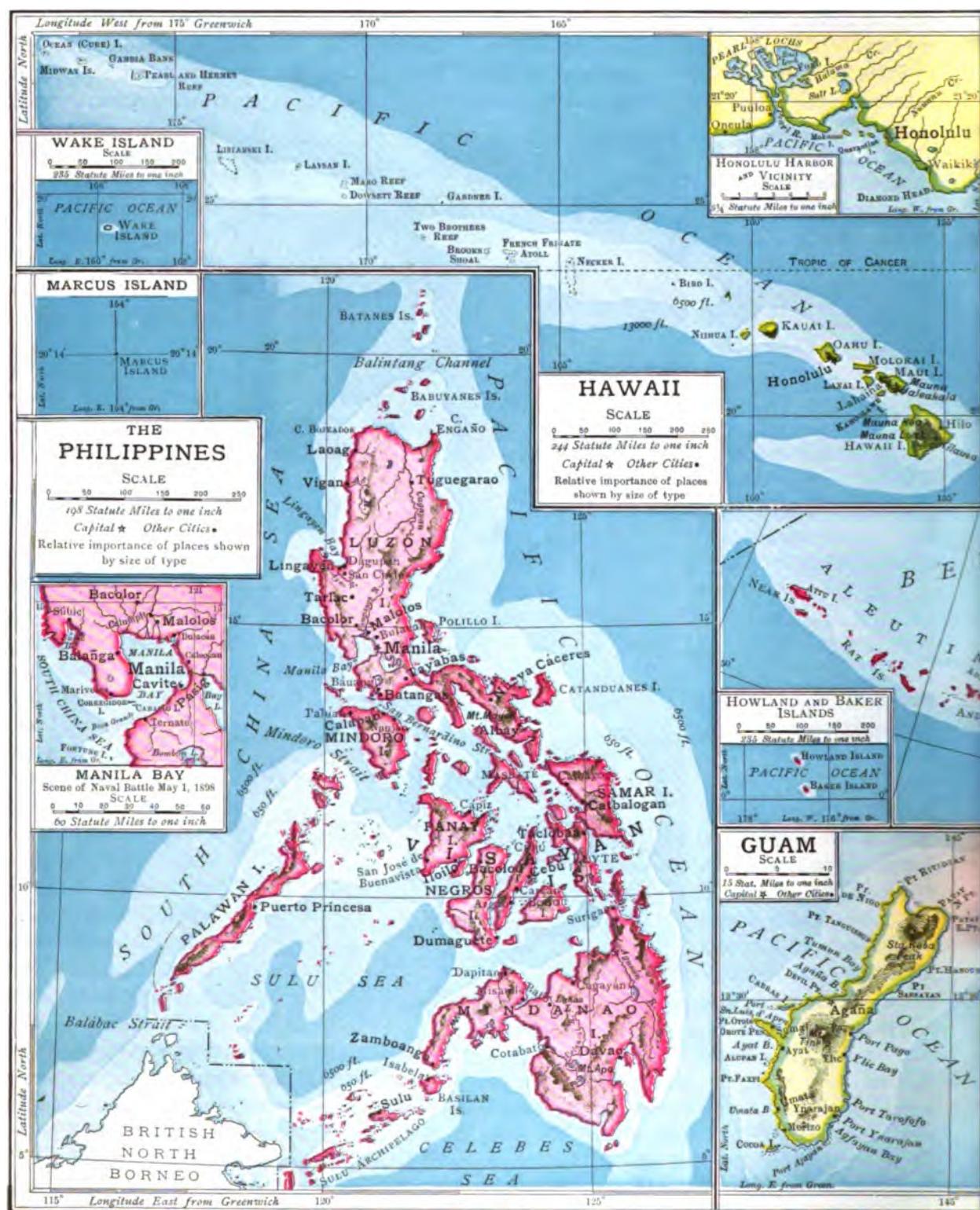


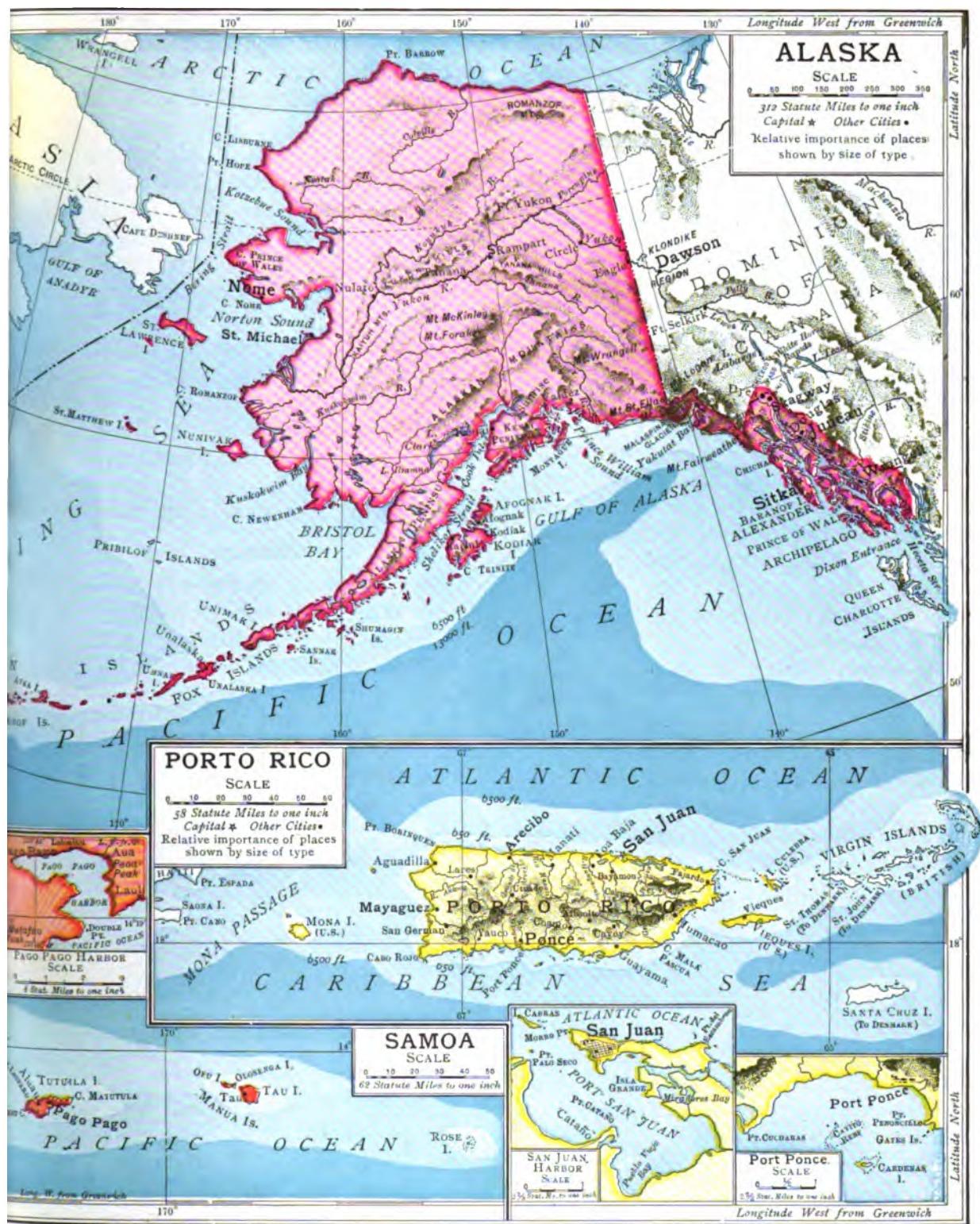
FIG. 302. *The famous Treadwell gold mine as seen from the water.*

Climate and Vegetation. Alaska lies in the path of the westerly winds. It therefore has a moist and somewhat equable climate along its coast, with a rainfall greater than that in any other part of North America. Hence forests grow on the slopes of the mountains up to a height of 2,500 or 3,000 feet. In the higher altitudes glaciers are found, of which the largest is the Malaspina glacier. The best known is the Muir glacier, which reaches the sea and therefore can be readily visited.

The climate of the interior is marked by strong contrasts between the summer and the winter. In winter the temperatures are low, the rainfall slight, and the ground may be frozen to a depth of over one hundred feet. In summer the temperature is relatively high, the surface soil melts, and the ground is covered with vegetation which reaches up the mountains to a height of several thousand feet. The northern portion lies in the tundra region, and is therefore devoid of the larger forms of vegetation found farther to the south. (See Fig. 119.)

Products. The rocks of the mountains of Alaska abound in minerals, and gold has been found in great quantities in the beach and river gravels. Hence mineral wealth is the greatest natural resource of the country. Coal is also widely distributed, but it





is generally almost inaccessible, and is mined only along the coast, where it can be secured at a reasonable cost. Gold is the most valuable mineral. For many years it has been



FIG. 304. *An Alaskan village.*

secured from the rocks about Juneau, so that a large town, dependent upon this industry, has grown up there. The discovery of gold on the Yukon and at Nome has added much to the wealth and population of Alaska. The gold-bearing gravels of the Yukon are richer in Canada, however, than they are in Alaska. (See Fig. 302.)

The second industry in rank in Alaska is fishing. Salmon are caught in great numbers in the rivers and estuaries of the western coast, as they are farther south in the United States. Most of the salmon are canned, and Alaska produces annually more than one hundred million pounds of canned salmon, an amount far greater than is produced in Washington, the leading state of the Union in this industry.

The third product of Alaska is sealskins. The fur-bearing seals are found in large numbers on the Pribilof Islands, and furnish annually a great wealth of skins. Owing to the reckless slaughtering of the seals in recent years, however, the annual value of the product has been greatly reduced and has declined in importance.

Cities. The largest permanent settlements are at Sitka and at Juneau. Sitka, an interesting village and the seat of the territorial

government, is the oldest town in the territory. It contains an interesting Greek church, built during the Russian possession of the region, and is much visited by tourists annually.

Trade. The trade of Alaska is principally with the United States. The exports are chiefly gold, dried and cured fish, fish oil, and whalebone. In return Alaska receives from our country iron and steel goods, tinware, meat and dairy products, breadstuffs, wearing apparel, and explosives; that is, the larger part of the necessities of life have to be imported. It is not at all probable that the resources of Alaska can be developed so that the food and provisions necessary to supply the needs of the population, which is engaged in fishing and mining, can be grown within the borders of the country.

HAWAII

About one-third of the way across the Pacific Ocean, and lying within the Hot Belt, is a group of eight inhabited islands and several rocky islets, known as the *Hawaiian Islands*, or *Hawaii*. (See Fig. 303.) These islands have belonged to the United States since 1898. They have a combined area about as large as that of the state of Connecticut, and



FIG. 305. *The crater of Mauna Loa, showing the steam and vapors rising from it.*

a population of over 150,000. The largest island is Hawaii. The most populous is Oahu, which contains *Honolulu*, the largest city. More than half the population is Japanese and Chinese, though the white

people are rapidly increasing; the native Hawaiians are decreasing.

Surface. The Hawaiian Islands are mountainous and extremely volcanic. The chief



FIG. 306. Loading sugar cane in one of the large Hawaiian sugar cane plantations.

volcanoes are *Mauna Kea* and *Mauna Loa*, each with an altitude of over 13,500 feet. On the slopes of the latter mountain is the volcano of *Kilauea*, a great seething lake of lava, which once in every twelve or thirteen years overflows. The eruption of this volcano has none of the violent features which are usually associated with volcanic eruptions. The lava simply wells up and flows down across the country, burning and destroying everything in its path. The volcanic rock weathers rapidly in the moist, tropical climate, and makes an extremely fertile and productive soil.

Climate. Owing to the influence of the ocean the range of temperature in the Hawaiian Islands is only about ten degrees, which is lower than in any other region in a similar latitude. There are only two seasons, winter and summer, with the greatest rainfall in the winter.

Products; Trade; Cities. Hawaii is the fourth largest producer of cane sugar in the world. Sugar is the leading crop. The entire output is nearly as great as that of Louisiana. Rice and bananas are raised in large quantities. Hawaii raises bananas for commerce and produces more rice than South

Carolina, but not so much as Louisiana. Stock raising is an important occupation on the higher slopes, where crops cannot be so readily grown.

About nine-tenths of the exports of the Hawaiian Islands go to the United States. Sugar, sent to California for refining, has the leading place. The imports are also received chiefly from the United States, and include breadstuffs, machinery, cotton manufactures, lumber, and provisions.

Owing to their position the islands form an important calling place for Pacific steamers. They are connected with one another by a well-developed system of wireless telegraphy, and are connected with America and the continent of Asia by a cable finished in 1903.

Honolulu, the capital and largest city, is a modern town, with electric cars and electric lights. It is well provided with wharves for the accommodation of the large and increasing trade.

THE PHILIPPINES

The Philippines, which have been possessions of the United States since 1898, are the most numerous group of islands southeast of Asia. They include 1,725 islands, with a total



FIG. 307. Rice field in the Philippines.

area about equal to that of the territory of New Mexico. Two-thirds of this area is in the larger islands, *Luzon* and *Mindanao*. The population is now more than seven millions, of which the larger part belong-

to the yellow race. Europeans are found in all of the leading cities, and are rapidly increasing in numbers.

Surface. The surface of the Philippines is generally mountainous and volcanic, with some peaks rising over 10,000 feet. Extensive lowlands exist in the two larger islands, and it is in these districts that agriculture is best developed.

Climate and Vegetation. The climate is everywhere tropical on account of the location of the islands. In *Manila*, the chief city, the temperature never goes below 59° or above 90°. The nights are generally cool, so that the warmth of the days is not so oppressive as in those regions where there is but little difference between the temperatures of day and night. The islands are swept by both monsoons, and the rainfall is therefore abundant during each season. The rainfall in the northern islands occurs mostly

during the prevalence of the northeast trade wind, and in the southern islands at the opposite season. Therefore the period of planting and harvest, which depends upon the rainfall, differs in the two sections.

Owing to the warmth and the moisture of the climate, the vegetation is very dense, and in many places tropical jungles abound. Because of the density of the vegetation, traveling in the country is carried on with difficulty.

Products. The chief products of the Philippines are tropical in their nature; they include hemp, sugar, coffee, cocoanuts, tobacco, and indigo. Rice is raised extensively in the more favorable regions, but is all used at home as food for the people. The forests

abound in cabinet and dye woods, but they have been little developed as yet, owing to the difficulties and the cost of getting the products to market.

The islands are rich in minerals, including gold, coal, copper, silver, and lead, but mining, like agriculture, has not as yet been developed as it can be.

Trade; Cities; Development. The principal part of the trade of the Philippines is with the United Kingdom, Hong-kong, Japan, France, and Spain. The United States receives nearly one-half of the exports, of which manila hemp is the chief. The principal imports are cotton goods, hardware, and machinery from the United Kingdom. The imports from the United States are increasing, but at present our country furnishes only about one-seventh of the goods that are received in trade.

The chief ports are at *Manila* and *Iloilo*. The harbor at Manila

is the best and may be made the equal of any of the harbors of the Pacific. The islands are now connected with Asia and with the United States by means of cables.

OTHER ISLANDS OF THE PACIFIC

The United States possesses a number of small islands in the Pacific, which are or may be important as cable and coaling stations. The chief of these are *Guam*, the largest island of the Ladrones, and *Tutuila*, in the Samoa group. The others are *Howland*, *Baker*, *Wake*, *Midway*, and *Marcus* islands.

Guam, with an area of about two hundred square miles, is occupied mostly by descendants of immigrants from the Philippines. It raises some cocoanuts for commerce.



FIG. 308. Loading manila hemp rope to carry to the ships for transportation.

Tutuila is the only possession of the United States in the Southern Hemisphere. It contains the port of Pago-Pago, one of the best harbors of the Pacific Ocean, and is therefore an exceedingly valuable coaling station.

PORTO RICO

Porto Rico, one of the larger islands of the West Indies, is about three and a half times as large as Rhode Island, and contains a population of nearly a million. It has a density of population surpassing all the states of the Union except Rhode Island and Massachusetts. The people are mostly of Spanish descent or are negroes.

Surface and Climate. The surface of Porto Rico is rolling and diversified with mountains rising along the axis of the island to a height of over 3,000 feet. There are extensive plains near the coast which are devoted to agriculture.

Porto Rico lies in the northerly trade-wind belt, and therefore has an abundant rainfall, especially in the north. The heavy rainfall provides an ample supply of water to the rivers, so that the region is well watered. The lower portions of the rivers are navigable for small vessels.



FIG. 309. A general view along the Pasig River, Manila, showing the shipping of this port.

Products. Owing to the warmth and the moisture, the slopes of the island are covered with forests, which contain valuable supplies of cabinet woods, as do the forests of the other Caribbean regions.

Sugar, tobacco, coffee, and tropical fruits are the leading agricultural products. Two-thirds of the trade is with the United States. It includes sugar and cigars. France ranks next in the amount of commerce. The imports are almost entirely from the United States, and include cotton goods, machinery, hog products, and flour.

The chief towns are the ports of *San Juan* and *Ponce*.

Questions and Exercises

(1) Find out what you can about one of the three great industries of Alaska. (2) Locate the places where these industries are centered. (3) Describe the route by which the products of Alaska reach Chicago or Washington. (4) Find out when Sitka ceased to be a Russian town.

(5) What tempers the climate of the Hawaiian Islands? (6) What objects of interest does a stranger find in these islands? (7) What steamer lines stop at Honolulu? (8) Why is sugar refining a large business at San Francisco? (9) What is the latitude of the Hawaiian Islands? (10) Locate the Philippines. (11) How does their climate differ from that of Hawaii? (12) What islands of North America are visited by tropical cyclones? (13) What can you say of the future prospects of our islands in the Pacific as regards trade and other industries?

(14) On an outline map of the world locate all the dependencies of the United States and draw commercial routes between them and this country. Show the cable lines. (15) When it is noon on Monday at San Francisco tell what day and time it is at Manila. Write this on map.



FIG. 310. Typical seashore village on one of the islands of the Sulu Archipelago.

SUMMARY

With the development of the last few years and the increase in possessions outside of the United States proper, our country has become one of the great world powers, ranking with the leading nations of Europe. The progress of the country has been largely due to the favorable conditions for the development of agriculture, manufacturing, and commerce. The vast areas of fertile soil in the central states, lying in a climate favorable to agriculture, has made it possible for the country to become the home of millions of people from the European nations. The development of the agricultural possibilities has created a great wealth of breadstuffs and provisions available for commerce. The United States has therefore become the principal country furnishing food to Europe.

The almost inexhaustible resources of iron and coal, and the development of cotton raising in the South, have made the United States one of the greatest manufacturing countries of the world.

The location of the United States across the smaller ocean from the leading nations of Europe, and the fact that it is well supplied with large and commodious harbors, accessible throughout the year, have favored the development of Atlantic commerce. The numerous water gaps through the Appalachian Highland, and the natural highways of commerce to the South and Southwest, have made it possible to transport the products of the interior to the eastern ports cheaply and rapidly. The development of the water commerce along the Great Lakes has also been of great importance commercially.

The commercial cities along the Pacific Coast are now developing rapidly, owing to the increase in commerce with our possessions in the Pacific and the greater ease in getting to the ports of the Far East.

Because of these many favoring conditions, the United States is now the third commercial

country in the world, having more than ten per cent of the world's trade. It is exceeded in its exports only by the United Kingdom, though it is closely followed by Germany. In its imports it is exceeded by both the United Kingdom and Germany. Its principal trade is with these two countries, Canada, and France.

The chief exports are cotton, provisions, breadstuffs, iron and steel goods, and mineral oil. The principal manufactured products sent in trade are, in the order of their importance, iron and steel goods, refined oils, cotton goods, leather, and agricultural implements.

Manufactured products form about sixty per cent and agricultural products about thirty per cent of the exports of the United States. The principal products of the soil, in the order of their importance in trade, are wheat, flour, corn, cattle and hog products, and cotton. More than one-half the manufactured products are sent to Europe and one-fourth to other countries of North America.

The chief imports are products that cannot be produced at home, either because of the climate or because the country has not developed its possibilities in certain lines because of the far greater opportunities in the lines generally followed. The principal imports are from the warmer countries and include sugar from the West Indies, Cuba, and Brazil; coffee from Brazil and Central America; vegetable fibers from Mexico, the Philippines, and India; chemicals, drugs, and dyes; hides and skins from Europe and South America; silk from Japan, Italy, and China; rubber from Brazil and Europe; tea from China and Japan.

Among the other imports are laces from the United Kingdom, Germany, and Switzerland; wool and woolen goods from the United Kingdom; diamonds; silk goods from France; and tin from the United Kingdom and the East Indies.

XXXVIII. COUNTRIES OF NORTHERN NORTH AMERICA

Ownership and Area. Northern North America comprises the *Dominion of Canada*, *Newfoundland*, *Greenland*, and *Alaska*. (See Fig. 312.) Alaska belongs to the United States; Greenland is owned by Denmark; Newfoundland, which includes the island of that name and a narrow strip of land along the eastern coast of Labrador, belongs to the United Kingdom. All the rest of northern North America is included in the Dominion of Canada, a colony of the United Kingdom.

THE DOMINION OF CANADA

Area and Population. The Dominion of Canada constitutes by far the largest and most important dependency of the British Empire in the Western Hemisphere. The area of Canada is a little larger than that of the United

States, but the population is only a little over 5,000,000, or about three-fourths the population of New York state.

Coast Line. The coast line of Canada is irregular on both oceans (see Fig. 312), but the valuable harbors are few, owing to the fact that during the winter months most of the Atlantic harbors are closed by ice. (See Fig. 82.) The harbors of the Pacific Coast are never icebound, but they do not as yet rank with the Atlantic ports for the reason that they are not so favorably situated for receiving agricultural products and for sending them to countries which are deficient in food supplies.

Surface. The northern extremity of the Appalachian Highland includes New Bruns-

wick and Nova Scotia. Rugged ranges of hills run nearly northeast and southwest and occupy a large part of the area of these two provinces, being most pronounced in New Brunswick. These uplands are largely in a wild state and for much of their extent are little known. Rich lowland valleys lie between the ridges and form the regions of densest population.

North of the St. Lawrence, in the little-known territory of Ungava and in eastern Quebec, is the Labrador Plateau. It is a low, rocky, thin-soiled plateau, the highest portion of which forms a divide for streams

which flow outward in every direction. Western Quebec, Ontario, and southern Keewatin are in the hilly eastern lowlands, which have been heavily glaciated.

The best soil and the richest lowlands in Canada are along the St. Lawrence River and the Great Lakes, as is indicated by the

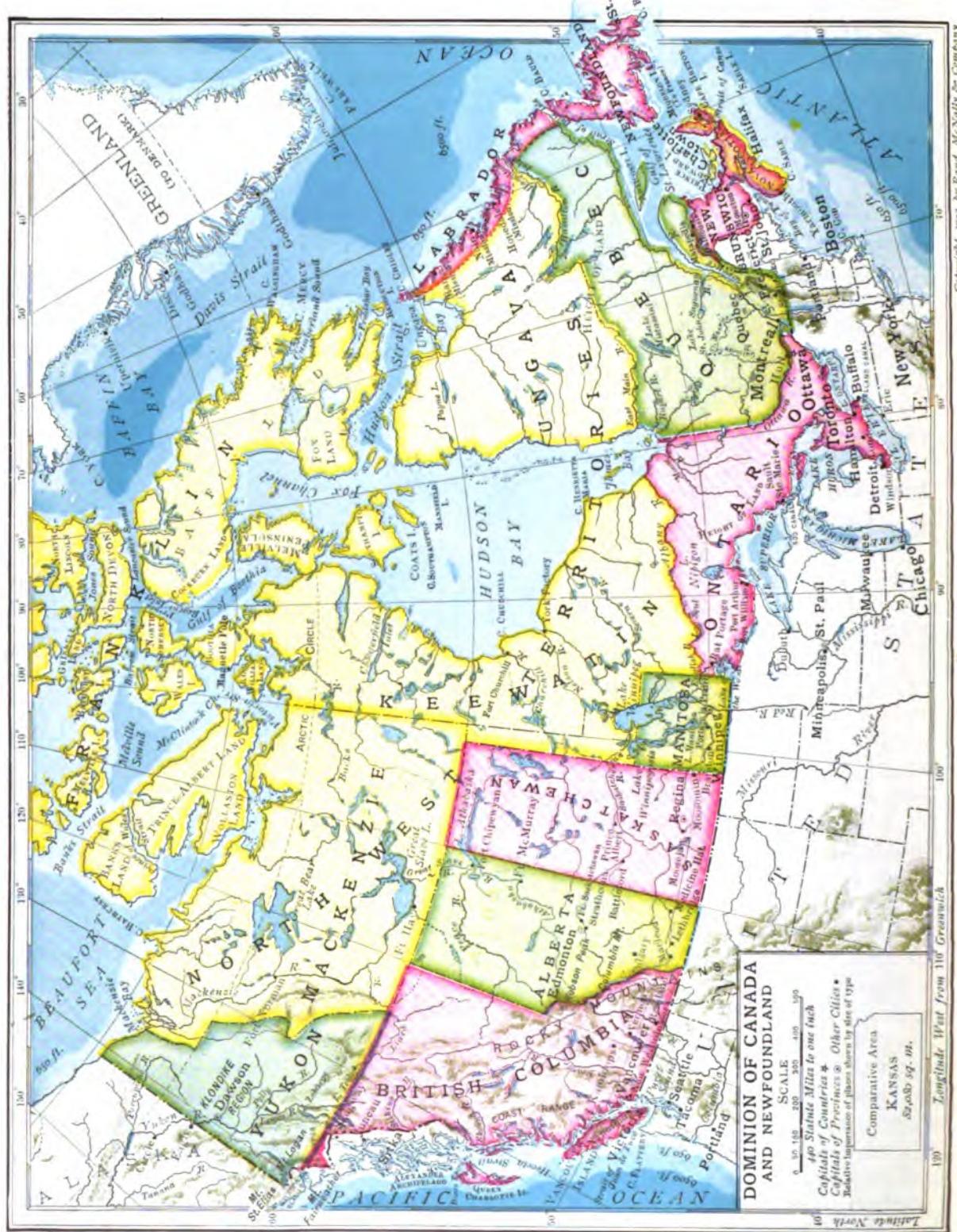
fact that almost three-fourths of the total population of Canada is found in the provinces of Quebec and Ontario, which lie in this region.

West of the area drained by the St. Lawrence River and the Great Lakes, and extending to the foothills of the Cordilleran Highland, is the Great Central Plain, the northern continuation of the Great Central Plain of the United States. (See Fig. 173.)

The Cordilleran Highland occupies the whole region between the Great Central Plain and the Pacific Ocean, and reaches its maximum altitudes near the boundary of Alaska. It consists of many different ranges, contains many great glaciers, and is renowned for its magnificent scenery. (See Fig. 174.)



FIG. 311. A glacier in British Columbia.



Drainage. The principal river of Canada is the *St. Lawrence*, which drains the five *Great Lakes*. (See Fig. 312.) The basin of this river is the great highway for Canadian trade, and is increasing in importance each year, owing to the greater use of the canals which have been built around the rapids in the *St. Marys River* at *Sault Ste. Marie*.

The *Mackenzie River* is one of the long rivers of America, but it drains a region of little value on account of the climate, and hence is of little importance. The *Yukon River*, the other great river of northwestern America, is navigable to the Klondike gold fields in the northwestern corner of the Dominion, and is an important highway of commerce in the summer time, not only for the Territory of Yukon but for Alaska.

Of the western rivers which break through the ranges of the Cordilleran Highland the *Fraser* and the *Columbia* are the largest.

They are not available for water commerce, but their valleys offer the best routes across the mountain ranges, and are therefore much used in travel and transportation.

Climate. The climate of Canada is continental, and is therefore characterized by wide variations in temperature. The country may be divided according to its climate into three great divisions: the southeastern portion, the interior, and the western coast. The southeastern portion extends west nearly to *Winnipeg*, and is characterized by a great seasonal range of temperature and by ample rainfall during the summer months. (See Figs. 82 and 84.) The spring is late along the eastern coast because the inblowing winds pass over a cold portion of the ocean, and therefore bring little warmth.

The interior region, extending from near

Winnipeg to the eastern slopes of the Cordilleran Highland, is cold in winter and is fairly warm and dry in summer. It warms up in the spring much more rapidly than the eastern section.

The Pacific slopes of the Cordilleran Highland have a moderate range of temperature and are extremely moist. The rainfall is heavy, as it is both to the south in the western portions of Washington and Oregon and to the north along the Alaskan coast and the Aleutian Islands. (See Fig. 97.)

Plants and Animals. The tundra area of Canada, with its low shrubs and abundant mosses, is commonly known as the "Barren Lands" and sometimes as "The Land of Little Sticks." It covers all of northern Canada as far south as a line extending from the mouth of the *Mackenzie River* southeast to *Fort Churchill* on *Hudson Bay* and then east through *Ungava*. South of the tundra

area is a great forest region which covers the larger part of the Dominion and extends into the United States. (See Fig. 119.)

In the southeastern provinces the forests in the lower lands have been extensively cleared to furnish land for agriculture. Those along the *Ottawa River* are an important source of supply of wood pulp for the making of paper, and the forests of *New Brunswick* yield valuable timber products.

This forest region is the home of many fur-bearing animals which are hunted for the sake of their skins.

The most characteristic animals of Canada are the caribou, which are often seen in great herds, and the musk ox, which is found nowhere else in North America. (See Fig. 140.)

Trade. The Dominion of Canada has about one-eighth of the commerce of North America,



FIG. 313. *The St. Lawrence River below Montreal, showing a raft of timber being floated to Quebec.*

which is carried on chiefly with the United Kingdom and the United States. The larger part of the exports goes to the United Kingdom, but more than one-half of the imports are received from the United States. The chief exports to the United

Kingdom are animal products, wood and timber, and wheat. Wood and timber, fish and copper are shipped to the United States. The imports are chiefly iron and steel, coal, breadstuffs, and cotton. Canada is the largest exporter of cheese in the world, and has some of the largest and most important fisheries.

NOVA SCOTIA, PRINCE EDWARD ISLAND, AND NEW BRUNSWICK

Surface and Coast Line.

The surface of Nova Scotia, Prince Edward Island, and New Brunswick is extremely varied, as might be expected from the fact that the Appalachian Highland occupies a large part of this region. The coast line is irregular (see Fig. 312) and its indentations contain several excellent harbors; commerce is impeded, however, by the great prevalence of fogs, especially in the summer months.

Occupations. The lowlands of the interior of Nova Scotia and Prince Edward Island are devoted to agriculture; grain, apples, and potatoes are the chief crops. Dairying and the raising of horses for the British market are the other leading occupations of the interior. Nova Scotia is rich in coal, some of which can be readily mined and shipped because of the close proximity of the mines to the sea. Lumbering is the most important industry of New Brunswick.

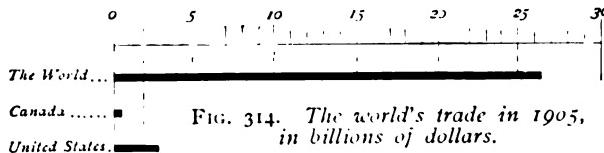


FIG. 314. *The world's trade in 1905, in billions of dollars.*

Owing to the nearness of Nova Scotia, Prince Edward Island, and New Brunswick to the great fishing grounds of the continental shelf, fishing, especially for cod, lobsters, and herring, is the leading occupation in the coast towns. The fishing

privileges over the Grand Banks are shared with the United States and France. Fishing is the most important industry in Nova Scotia and Prince Edward Island, and is second in importance in New Brunswick.

Cities. *Halifax*, situated on the finest harbor in Nova Scotia, is the most important naval and coaling station of the United Kingdom on the continent of North America. *Sydney*, on Cape Breton Island, has the largest iron and steel works in the Dominion.

St. John, the largest city in New Brunswick, is favorably situated on a large harbor which opens into the Bay of Fundy. This harbor is free from ice the year round, and its trade with the United Kingdom is constantly increasing.

QUEBEC

Description. The Province of Quebec includes most of the fertile valley of the St. Lawrence River and the southern part of the barren Labrador Plateau. The wilderness of northern Quebec is a favorite fishing and camping country for sportsmen. The Saguenay River is a magnificent fiord, world-renowned for the splendor of its scenery, and visited annually by large numbers of tourists. The highland area of southern Quebec, like that of northern New Brunswick, is visited by



FIG. 315. *The fishing village of Cape Breton.*



FIG. 316. Rafts of logs on the St. Lawrence River at Quebec.

many sportsmen and fishermen during the summer months.

Industries. The larger portion of the population of the Province of Quebec is in the valley of the St. Lawrence. Northern Quebec has only small, scattered settlements, found in the small valleys, where a fair living can be secured by means of agriculture.

Most of the people of the province are engaged in tilling the soil. The chief crops are cereals, hay, tobacco, and fruits, although great quantities of cheese and butter are made, and a large number of horses are raised. Lumbering is the second occupation in importance and is constantly growing because of the prevalence of the valuable soft white pine, the supply of which in northern United States is being rapidly exhausted. (See Figs. 313 and 316.)

Cities. Quebec, the capital and the oldest city of the province, is beautifully situated, partly on a bluff and partly at the foot of a bluff facing the St. Lawrence River. These heights at the head of the St. Lawrence estuary, and the former head of navigation, furnished the best possible situation for a

fortified town. Hence the old city was built on the bluff. Quebec was formerly the chief commercial city of the province because of its location. In late years it has yielded that supremacy to Montreal, because the St. Lawrence has been so deepened that ocean-going vessels can reach the latter city.

Montreal, with a population more than four times as great as that of Quebec, is the largest city in the Dominion. It is also the chief commercial city, both for water and land transportation, since it is an important railroad center, and the terminus for the Great Lakes steamship lines.

ONTARIO

Climate and Soil. Ontario includes the portion of the St. Lawrence Valley west of Quebec and the Canadian portion of the Basin of the Great Lakes. It extends as far south as northern Pennsylvania and as far north as Hudson Bay. The summer climate is warm and the soil is well watered. (See Fig. 84.) The coast along the Great Lakes, except

Lake Huron, is low, and forms good farming land. The northern shore of Lake Huron is high and rugged. Owing to the gentle slopes, favorable climate, and fine glacial soils, the



FIG. 317. The parliament house at Quebec.



FIG. 318. A fruit farm in southern Ontario.

region bordering Lake Erie is extremely fertile, and is often called the "Garden of Canada." (See Fig. 318.)

Products; Cities.

Wine, table grapes, apples, wheat, oats, and beans are the chief agricultural products. Ontario leads all the provinces in the making of cheese. The mineral deposits include rich copper and nickel fields along the north shores of Lake Huron and Lake Superior.



FIG. 319. A barley crop ready for shipment in Manitoba.



FIG. 320. A sawmill and lumber yard near Ottawa.

Ottawa, the seat of the Dominion government, is the center of a large lumber trade, and has the largest sawmills in Canada. (See Fig. 320.) Toronto, on the north shore of Lake Ontario, is the commercial center of the province and an important railway terminus. It is also the seat of the provincial government of Ontario. Port Arthur, on the northern coast of Lake Superior, is the chief outlet for the wheat from Manitoba and the Canadian Northwest.

MANITOBA

Surface. The eastern portion of Manitoba is rocky and contains many lakes, of which Lake Winnipeg is



FIG. 321. Stacks of wheat on the level prairie land of Manitoba.

the largest. More than half the province lies in the level plain of "Lake Agassiz," which existed during the time when the great continental glacier occupied northern Canada and shed its waters into this basin. The outlet of the lake was through the Minnesota River into the Mississippi. Now the waters have drained away, and the level lake floor forms one of the most perfect plains in the world.

The western portion of Manitoba consists of a prairie rising eight to twelve hundred



FIG. 322. Main Street and City Hall Square, Winnipeg.

feet above the plain, and deeply cut by valleys made by the east-flowing rivers.

Products; Cities. Oats and barley are raised extensively on the prairies, though the soil and climate are not so favorable for agriculture as in the lake plain. Wheat is the leading crop in the lake plain, as it is to the south in Dakota and Minnesota. (See Figs. 178, 179, 319, and 321.)

Winnipeg, at the junction of two navigable rivers, is the



FIG. 323. A first-year farm in Manitoba. The land is just being cleared and cultivated.

chief town and railway center. Railroads radiate from it into the northwest as well as the south and west, so that the larger portion of the wheat sent eastward to Port Arthur and Port William for transportation over the Great Lakes passes through this city.

BRITISH COLUMBIA

Surface; Coast Line; Scenery. British Columbia is the largest province in the Dominion and is mostly occupied by the Cordilleran Highland. The coast line is extremely irregular and is bordered by magnificent fiords and guarded by a great series of offshore islands. The highland region, with its magnificent canyons, extensive glaciers, beautiful glacial lakes, and steep-sloped mountains, is one of the grandest scenic regions of the North American continent. (See Fig. 311.)

Products; Cities. The wealth of British Columbia consists of minerals, forest products, and fisheries. The minerals include gold, silver, copper, and coal, and are being developed rapidly. The forests of the coast side of the mountains are largely made up of the great Douglas firs, the products of which are prepared for market along the coast and on Vancouver Island. Salmon abound in the streams and are canned in great

quantities. Halibut, cod, and herring are found off the west coast.

The agricultural land of British Columbia is chiefly in the river valleys and the river deltas. A large part of the area has too heavy a rainfall for agriculture, so that this industry is of little importance.

Victoria, the capital, is situated on a good harbor, three miles from *Esquimalt*, the most important British naval station on the Pacific coast of North America. *Vancouver* has the best harbor, and is the terminus of several steamship lines connecting North America with Asia and Australia and also of the one transcontinental railroad of Canada.



FIG. 325. A cattle ranch in Saskatchewan.

ALBERTA AND SASKATCHEWAN

Surface; Industries; Development. The provinces of Alberta and Saskatchewan, except in the north where trees abound, are mainly flat, treeless, grassy plains. Agriculture is extensively developed in southeastern Saskatchewan; wheat, barley, and oats are the leading crops. The rest of the area is mainly devoted to grazing, particularly to the raising of cattle, horses, and sheep. The same is true of the southern continuation of this plain in the United States. (See Figs. 184, 324, and 325.)

The Territories.

The territories of *Mackenzie*, *Kee-watin*, *Ungava*, and *Franklin* are thinly populated



FIG. 324. A sheep ranch in Saskatchewan.

and little known. The only inhabitants of these regions are a few white fur traders, wandering Indians, and the Eskimos who live along the coast.

The territory of Yukon leaped suddenly into fame in 1896, owing to the discovery of gold in the river gravels of the tributaries of the Yukon River. *Dawson City*, the chief Canadian settlement in this area, is the center of the gold industry. At first the only communication with the rest of the world was by means of the Yukon River, which was open for navigation for only about four months of the year. During the winter mails were carried over the mountains by sledges and men. Recently, however, a railroad has been built from Skagway in Alaska to the head-waters of the Yukon, so that provisions can be more easily shipped to the miners and the gold can be more readily brought to the coast.

NEWFOUNDLAND

Occupation of the People; Cities. The principal occupation of the people of Newfoundland is fishing in the neighboring waters. Lobster canning is particularly important. The west coast of Newfoundland is frequented by the French as a fishing station.

The neighboring islands of *St. Pierre* and *Miquelon* belong to France and are also centers of the fishing industry.

St. Johns, the capital of Newfoundland, is a small town situated on a good harbor and therefore is the most important trade center on the island. It exports fish and manufactures cod-liver oil.



FIG. 326. A corral of horses in Alberta.



FIG. 327. A lumbering scene in Keweenaw, Ontario.

GREENLAND

Surface. Greenland, the largest island in the world, belongs to Denmark. The interior is wholly covered by ice, above which no mountains show. The coast is everywhere bordered by mountains and abounds in magnificent fiords.

People. The only white people are found along the southwest-

ern coast, where the low plain gives an opportunity for permanent settlement. Here are a few Danes in the small towns, but the larger portion of the population of Greenland is made up of Eskimos. The Eskimos depend upon hunting and fishing for their living, and travel great distances in the summer months to get their necessary food.

Towns and Trade. The only towns are *Godthaab* and *Upernivik*; the latter is the most northerly permanent settlement in the world.

What little trade the island has is chiefly with Denmark, and includes the down gathered from the eider duck, furs, and fish products.

Questions and Exercises

(1) When Canada has such an indented coast why are there not more good harbors? (2) Is the port of Vancouver closed in winter? Of Quebec? Of Montreal? (3) Draw a map of the great highway of the St. Lawrence and indicate the chief canals which aid navigation. (4) Locate the chief Canadian and American cities on this waterway. (5) Why are the Mackenzie and the Yukon rivers of so comparatively little commercial importance?

(6) Which city has more sunny days in winter, Montreal or Victoria? Give the reason. (7) How is the winter life of the two cities different? (8) Is the commerce of the Great Lakes closed

in winter? (Consult Fig. 84 for your answer.) (9) What influence upon the climate of the surrounding country do the Great Lakes have? (10) Why can grapes ripen in southern Ontario and not in eastern Montana?

(11) From what ports do steamers carry the exports of Canada to the United Kingdom? (12) Trace the routes across the Atlantic. (13) Locate the chief harbors of each of the maritime provinces. (14) How does the fog affect the fishermen off these coasts? Steamer traffic across the ocean? (15) Tell of the importance of Halifax to the United Kingdom.

(16) Describe the location of the city of Quebec. (17) Why is Montreal better located as an ocean trade route terminus than Quebec? (18) Draw the ocean and land routes which terminate at Montreal. (19) On an outline map of the world show the trade route between China and England via the Canadian Pacific. (20) Find the approximate distance by this route between Liverpool or Southampton and Yokohama. (21) Why is Ottawa well located for a capital city?



FIG. 328. The town of Ocoyacac, Mexico, showing a plain with a volcano in the distance.

XXXIX. MEXICO

Size and Population. Mexico, the largest of the countries of southern North America, has a little more than one-fifth the area and about one-sixth the population of the United States. About one-half the people are Mexicans; the rest are whites and Indians.

Surface. Mexico is largely occupied by the southern extension of the Cordilleran Highland, which includes a broad, arid plateau in the north. High mountains surround the central plateaus, and rise from 6,000 to 8,000 feet above them. (See Figs. 173 and 334.)

Many of the highest mountains are nearly extinct volcanoes, which tower above the snow line in peaks of great beauty. *Orizaba*, *Popocatepetl*, and *Iztaccihuatl* are the best known and most majestic peaks. *Orizaba* is one of the highest mountains of the continent. The peak of *Nevado de Toluca* is famous for its beautiful crater lake, which is also noteworthy because it is one of the highest lakes in the world.

The only considerable lowland is the narrow eastern plain bordering the Gulf of Mexico and including Yucatan. This plain is nowhere more than a thousand feet in altitude.

Drainage. The only important river of Mexico is the *Rio Grande*, which forms the boundary between the United States and Mexico. This river is usually dry in its lower courses in the dry sea-

son, and therefore does not form an adequate boundary between the two countries. In fact much trouble has been caused in the past by the cattle men of Mexico and Texas, who have driven their herds from one country to the other in search of pasture, without paying any attention to the boundary line.

Owing to the fact that Mexico narrows southward, and that the mountains run nearly parallel to the coast, the other rivers are short. Cut deeply into the western mountain walls are many dry, young valleys, or *barrancas*, formed by the rushing torrents of the wet season. During the dry season







FIG. 330. *A typical Mexican village.*

the streams disappear, but their valleys, clothed in luxuriant tangles of dense vegetation, form wonderful bits of scenery, even for a country that abounds in scenic features.

The northern plateau has interior drainage and few streams. Scattered over this region, as far south as the City of Mexico, are many picturesque, shallow lakes, some of which are only two or three feet in depth and are much less extensive than they once were. In fact, when the City of Mexico was first occupied by white people it was an island city, but now the surrounding lake has retreated and the resulting swamp has been drained.

Climate and Rainfall. Mexico lies entirely in the Hot Belt and is blown over by the trade winds. The climate, however, is extremely varied, owing to the influence of the highlands, which run nearly at right angles to the general direction of the winds, and which rise so high that their peaks have a climate like that of the Cold Caps.

The hottest portion, known as the Hot Lands, extends from sea level up to about 3,000 feet, and is occupied by tropical vegetation. Between 3,000 and 7,000 feet the climate and vegetation are temperate, and this region is therefore known as the Temperate Lands. From 7,000 to 10,000 or 11,000 feet the climate is cool, like that of the northern portions of the North Temperate Belt; the higher peaks are clothed in perpetual snow.

The rainy season begins in May and lasts until October. During the height of the season heavy rains fall almost daily in the lower altitudes, and the vegetation bursts into bloom. In the dry season there is practically no rainfall, and everything dries up or ceases growing. The heaviest rainfall is on the eastern mountain slopes, where, in places, it is as much as one hundred and thirty inches. (See Fig. 97.) The interior plateau, being shut off from the influence of the trade winds, is deficient in moisture; in some places the annual rainfall is less than twenty inches.

Products of the Soil. Owing to the warm, moist climate and the great abundance of sunshine in the Hot and Temperate Lands, the



FIG. 331. *The entrance to a Mexican village, showing the vegetation of the arid region.*

products of Mexico are mostly agricultural. In the Hot Lands cotton, coffee, cacao, vanilla, and tropical fruits are raised in abundance, and on the plains of Yucatan the valuable fiber *heniquen*, used for making rope and sacking, is the principal crop. Mahogany, logwood, and other valuable tropical woods are found in the forests covering the lower slopes. In parts of this area the vegetation is so dense that travel is well-nigh impossible; hence the population in the forest region is very scattered.

In the Temperate Lands maize, beans, and tobacco are the principal crops. Cochineal insects are also raised. They live on a certain form of cactus and are very valuable as

a red dye. In the plateau area are found the agaves, or maguey plants. They furnish valuable fibers, and their juices, when fermented, form *pulque* and *mescal*, the national alcoholic drinks. (See Fig. 184.)

Corn, wheat, and many other cereals common in the Temperate Belt abound in the cool zone and in the interior plateau. The most important cereal is maize, in the production of which Mexico is outranked only by the United States and Austria-Hungary. The trees of the temperate and cool zones are the common evergreens, which are found particularly in higher latitudes. They cover the mountain slopes to a height of 13,000 feet, and form dense forests as high as 11,000 feet. It is in the cool region that we find the densest population.

In the drier northern regions of the plateau, agriculture is possible only by means of irrigation. Hence grazing is the chief industry. Sheep are raised in large numbers for their wool, which is of a very fine quality. Large parts of this area are unoccupied.

Mineral Products. The mineral wealth of the mountain areas of Mexico is enormous. Silver is the most valuable mineral product;

in fact, Mexico produces about one-third of the silver of the world, and has vast areas as yet untouched. It is the second nation in the production of copper, and is rich in iron, coal, quicksilver, and other mineral products, though the latter have not been developed to any considerable extent. Sulphur is found in the volcanic areas, and jasper, Mexican onyx, and other gems and precious stones are found and exported in considerable quantities.

Trade and Cities. Nearly seventy per cent of the exports of Mexico are precious metals, for most of the agricultural

products are used at home. Cabinet woods, henique, vanilla, coffee, tobacco, cattle, and fruits are exported. The imports are mostly manufactured articles, such as iron and steel goods, cotton textiles, furniture, and other wood products. The larger part of the export trade is with the United States, and more than fifty per cent of the imports are secured from our country.

The best harbors of Mexico are found on the western coast. Few of these are important ports, however, because the products available for commerce are mostly raised in the eastern portion of the country. *Acapulco*, *Manzanillo*, and *Mazatlan* are the chief ports of the western coast. Acapulco, with its magnificent harbor, is a coaling station for vessels engaged in Pacific trade. The harbor of Mazatlan is shallow and unprotected. Its chief exports are metals and woods. Manzanillo is the leading western port for the exportation of cotton, sugar, and coffee.

The trade of Mexico is mostly centered on the eastern coast, because the harbors there have better connection with the agricultural regions. This section is well supplied with railroads connecting the ports with the interior. The most important commercial towns



FIG. 332. A market scene in a Mexican city.



FIG. 333. A Mexican mining village.

are *Tampico* and *Vera Cruz*. *Vera Cruz* is the chief port, owing to the fact that its harbor has recently been deepened so that ocean-going vessels can reach its wharves.

Besides the ports, the only important town is the ancient *City of Mexico*, the capital of the country. It is situated at an elevation of more than 7,000 feet, and is one of the most interesting old cities of America. It abounds in beautiful buildings built by the early Spaniards, in close association with which are found the modern buildings erected within recent years. The modern buildings are largely the result of the activity of people from the United States who have recently gone there to engage in manufacturing and agriculture. The cathedral of Mexico, built by the early Spaniards and still used as a place of worship by the Catholics, is one of the most famous and beautiful buildings of the Western Hemisphere. The City of Mexico is connected with the United States by two trunk lines of railroad.

Questions and Exercises

- (1) What is the area of Mexico? (2) How many of the eastern states of the United States could be included in its area? (3) From a study of its surface, what reason can you give for its being so thinly inhabited?
- (4) Which of the volcanic peaks mentioned in the text can be seen from the City of Mexico?
- (5) What does Rio Grande mean? (6) In what months is the lower course of this river usually dry? (7) What is meant by *interior drainage*? (8) Mention localities in the United States where interior basins are found.
- (9) What is the January and July temperature of the City of Mexico? (10) Which has the more healthful climate, Mexico or *Vera Cruz*? (11) Describe how in passing from *Vera Cruz* to the upper slopes of Mount Popocatepetl you

would pass through three zones of climate. (12) What contrast in vegetation would you see going on the railroad from *Vera Cruz* to Mexico? (13) On an outline map of Mexico, draw arrows showing the winds of the eastern and western coasts. (14) Color the map with shades of blue to show the regions of rainfall. (15) Locate a town in the region of heavy and light rainfall. (16) What influence has the northward movement of the Heat Equator upon the rains of Mexico?

(17) Where is the forest region and what are its products? (18) What tropical fruits are sent to the United States? From what port? (19) Find out if possible the amount of maize raised in a year by the United States and Mexico.



FIG. 334. The town of Pachuca, showing the rugged character of Mexico.

XL. CENTRAL AMERICA

Countries. The several small countries which make up Central America together occupy an area not quite one-half as large as the state of Texas. All these countries are independent republics except *British Honduras*, which is a colony of the United Kingdom, as are Canada and British Guiana.

Guatemala, the largest state of Central America, is a little larger than the state of New York; and *Salvador*, the smallest country in North America, is the size of Massachusetts. *Panama*, the most southern country of North America, belonged to Colombia, South America, until the latter part of 1903. It is now an independent republic, and is considered a part of Central America rather than of South America.

Surface and Climate. The whole of Central America, with the exception of a low, narrow plain on the eastern coast, is extremely mountainous. Owing to its position, the climate depends chiefly upon the influence of the trade winds. The eastern coast has a heavy

rainfall and is occupied by dense forests, in which the only inhabitants are Indians. The Pacific slope has a dry period from November to May. (See Fig. 97.)

Owing to the influence of elevation, Central America, like Mexico, may be divided into the Hot Lands, the Temperate Lands, and the Cool Lands. The best climate is found in the mountains at an elevation of over 6,000 feet.

Products. Owing to the warm, moist climate and deep, rich soil, vegetation thrives everywhere in Central America, and agricultural products are the principal wealth of the country. On the Hot Lands below 3,000 feet, characteristic tropical plants like cacao, india-rubber trees, and the cocoanut palm abound. The Temperate Lands, lying between 3,000 and 6,000 feet, are largely devoted to coffee raising, especially in Guatemala and Salvador. In the Cool Lands potatoes, grain, maize, and beans are raised, as they are in the similar area of Mexico.

Grazing is the common occupation in the higher, drier regions of Honduras and Nicaragua, where cattle are raised. Sheep are found in Guatemala. The mineral products are extremely rich, but are little worked. Therefore they are of slight importance, even in home trade.

Trade and Cities. Guatemala produces more coffee than any other country of Central America. The city of Guatemala, the larg-



FIG. 335. A coffee plantation in Guatemala.

est city of Central America, is the center of the coffee trade, and *Puerto Barrios*, the only port of any importance, exports most of the crop. Guatemala does most of its trading with the United States and Germany.

The ports of Honduras are small and unimportant. Fruits, some gold and silver, and timber products are sent to the United States.

The trade of British Honduras is mostly with the United Kingdom. The principal export is timber, brought down from the interior by the rivers. Bananas and cocoanuts are sent to the United States.

Salvador ranks next to Guatemala in the production of coffee. Coffee, indigo, tobacco, and silver are the leading exports. The commerce of Salvador is mostly with the United Kingdom and the United States, and is chiefly centered in *Libertad*, the port of *San Salvador*.

The principal products of Nicaragua are coffee from the west coast, hides from the plateau area, and forest products from the moist eastern coast. The chief port on the Caribbean Sea is *Blue-fields*, but it is not easily accessible from the interior. Hence *Blue-fields* is not so important in trade as *Corinto* on the west coast,

which has a well-protected harbor and good railroad connections. Products sent to the United States generally pass through *Corinto* and then over the Isthmus of Panama.



FIG. 336. An Indian village in the mountainous highlands of Guatemala.

The dry western sides of the mountains of Costa Rica produce coffee of a superior quality. This coffee forms fifty per cent of the exports of the country; the larger portion goes to the United Kingdom. The other products of importance in trade are bananas, hides, rubber, and tortoise shell. Nearly all the commerce is centered in *Punta Arenas* on the western coast.

The products of Panama play a small part in the world's trade. Panama, however, is the most important country in Central America because of its position. The Isthmus of Panama has long been a barrier to trade, because all goods in transit between the Atlantic ports of North America or Europe and the Pacific ports of the Americas and Asia had to be transferred by rail between *Panama* and *Colon*, two ports on opposite sides of the isthmus. In a few years a ship canal, which was begun many years ago by the French, will be cut across the isthmus by the United States. Panama will then be situated on one of the world's great highways of trade, as Port Said and Suez have been since the completion of the Suez Canal.

Questions and Exercises

- (1) What is the chief reason why these countries have not been occupied largely by white people? (2) What portions are best fitted for white races? (3) How does the climate of Central America determine its products? (4) Make a list of the chief products and opposite each write the name of the country producing it; in a third column write the name of the chief port of the country. (5) What products of Central America are found in Mexico also? (6) Mark with a cross the products which are sent to your home. (7) On a map of the world show how ocean trade routes will be shortened by the Isthmian Canal. (8) Why have Panama and Colon grown up?



FIG. 337. *Mont Pelée, Martinique, in eruption.*

XLI. THE WEST INDIES

Ownership. The West Indies include the great series of islands lying chiefly in the Gulf of Mexico and the Caribbean Sea. The larger islands to the west are known as the *Greater Antilles*, and the smaller islands to the east as the *Lesser Antilles*. *Cuba*, *Haiti*, and *Santo Domingo* are independent countries. *Porto Rico* belongs to the United States, and the *Bahamas*, *Jamaica*, and several other smaller islands belong to the United Kingdom. The remaining islands are possessions of France, the Netherlands, and Denmark.

Size and Surface.

The islands of the West Indies vary in size from *Cuba*, with an area about as large as that of Pennsylvania, to minute coral islands rising only a few feet above the level of the sea.

With the exception of the *Bahamas*, which include about 3,000 low coral reefs, nearly

all the islands in this region are mountainous. A large number of them are volcanic, but until the eruption of *Mont Pelée* in 1902 it was supposed that the volcanic energy was weak.

Climate; Soil. The climate of the West Indies is tropical and, as in other tropical countries, the range of temperature is small. The changes of weather from day to day are few, except from July to October, when the islands are liable to be swept by severe tropical cyclones, which often do an immense amount of damage to crops and property. The rainy season comes toward the end of the summer, and causes a heavy daily rainfall. None of the islands has so well-defined a dry season as some parts of North America.

Owing to the prevailing moist climate and

to the deep, rich soil, all of the West Indies except the Bahamas, St. Thomas, and Antigua are extremely fertile. Vegetation grows in tropical luxuriance on the windward slopes.

People. The progressive people of the West Indies are mostly of Spanish descent, and Spanish is generally spoken throughout the islands except in the English colonies. The region was formerly occupied by native Indians, but they have now practically disappeared except in St. Vincent. Negroes are found in great numbers on all the islands, and furnish most of the labor for the plantations. They outnumber the whites except in Cuba.

CUBA

Surface and Coast

Line. The island of Cuba includes about half the area of the West Indies and is the largest of the independent countries of that group. It is largely occupied by rugged mountains, particularly in the east and west, with a low-lying plain in the interior. The mountains are generally not over 3,000 feet in height, though this height is exceeded in the province of Santiago de Cuba. The coast is everywhere bordered by rugged cliffs, except in the central portion of the southern shore. The mountains are broken by many drowned valleys, forming land-locked harbors which furnish excellent shelter in times of storm. The most important harbor of Cuba is that of Havana on the north coast.

Productions. The soil of Cuba is the best in the world for the raising of sugar cane, and sugar is therefore the most valuable product of the island. The large plantations on which the sugar cane is grown can be made to yield seven crops without replanting.



FIG. 338. *The mountainous surface of Cuba.*

Tobacco is raised extensively on the slopes of the western mountains, and forms the second crop in importance. Havana tobacco, as all Cuban tobacco is called, is much prized for its quality and is in great demand in the United States. Coffee, bananas, oranges, and Indian corn are the other noteworthy crops. Iron and copper are found in rich abundance, especially about Santiago de Cuba.

Trade; Cities. Most of the productions of Cuba are sent to the chief exporting points by coasting vessels, although railroads are extensively developed in the western portion of the island. The chief imports are flour and manufactured goods from the United States, rice from Europe and from the other West Indian islands, and salt fish from British America. The larger portion of the trade is with the United States.

Havana, the harbor nearest to the United States, is the chief exporting center for tobacco, and handles about twenty per cent of the sugar. The trade of the other ports consists largely of products grown in the immediate vicinity.

HAITI AND SANTO DOMINGO

Trade; Cities. Haiti and Santo Domingo are negro republics on the same island. The immense resources of the countries are not well developed. Coffee is the chief product of Haiti, although cacao and logwood are also exported. *Port au Prince* has practically all the trade, which is mostly with France.

The trade of Santo Domingo is chiefly with the United States, and includes sugar, tobacco, and cacao. *Puerto Plata*, on the northern coast, is the leading port, but is now closely rivaled by *Santo Domingo*, the capital.

JAMAICA

Products and Trade. The most important products of Jamaica are tropical fruits, sugar, rum, and coffee. The trade is centered mostly at *Port Antonio*, on the northern coast. Lines of fruit steamers, devoted principally to the banana trade, connect this port and *Kingston* with Boston and New York.

BAHAMAS

Climate; Trade. The Bahama Islands are best known as a winter health resort on account of their mild climate. The trade is principally with the near-by United States, and includes oranges, pineapples and other tropical fruits, and sponges.

LESSER ANTILLES

Products; Trade. The people of the islands of the Lesser Antilles depend largely upon the production of sugar for their living, and import most of their food. Cacao, spices, lime juice, and fruits are also produced for export. The island of Trinidad is noted for its asphalt. The trade of Barbados is mostly with the United States, but that of the other islands is chiefly with the several countries to which they belong.

BERMUDAS

Position; Trade. The Bermudas, a group of small islands about six hundred miles east of North Carolina, belong to the United Kingdom. They do not form a part of the West



FIG. 339. A native family and their home in Jamaica.



FIG. 340. Harvesting sugar cane in Martinique.

Indies, though they resemble the Bahamas in being formed by corals. Owing to the influence of the northward-moving waters of the warm Atlantic Drift, corals grow here farther north than in any other part of the world.

The trade of the Bermudas is mostly with the United States, and includes early onions, potatoes, Easter lilies in the spring, and lily bulbs during the rest of the year. *Hamilton*, the only port of importance, is the metropolis of the islands.

Questions and Exercises

- (1) On a map of North America color the West Indies according to the various countries which own them, leaving uncolored those which are independent of a great power.
- (2) Tell what you can of the recent eruption of Mont Pelée at Martinique.
- (3) How does the presence of the ocean affect the climate of these islands? Compare their summer temperature with your own; their winter temperature.
- (4) From what plant besides the cane is sugar obtained? Does our country produce much of this sugar? How does the production of this sugar affect the sugar industry of Cuba?
- (5) On the map used in Exercise 1 locate the chief ports of the West Indies and draw trade routes to the United States. On the margin of the map write the imports from the United States; the exports to the United States.
- (6) Make a list of the products of these islands and opposite each write the islands where each is produced.
- (7) Why have the resources of these islands not been so well developed as those of the Mississippi Basin?
- (8) Make a list of the nations having possessions in North America, and opposite each write the names of these possessions.

SOUTH AMERICA

XLII. THE CONTINENT AS A WHOLE

Size and Position. South America is the fourth in size of all the continents. (See Fig. 28.) It is nearly twice as large as Europe, a little smaller than the whole Russian Empire, and contains about one-seventh of the land of the world.

South America was explored and developed by the Spanish and the Portuguese and to-day the larger proportion of the white inhabitants speak these languages. Throughout the continent are large areas that are but little known, and there are few cities of dense population.

The larger part of South America lies in the Hot Belt, and hence has a tropical climate and the chief products are tropical. The extreme southern tip of South America extends into the Cold Cap, and is the only land of any of the continents in the Southern Hemisphere having a cold climate. (See Fig. 74.)

Coast Line. The coast line of South America is regular, except in the south and southwest, where it is bordered by islands and indented by many fiords. There are few bays or estuaries forming harbors; the principal ones are at *Bahia*, *Rio de Janeiro*, *Guayaquil*, and at the mouth of the La Plata. (See Fig. 346.)

Surface. A large portion of South America is a great lowland, not more than six

hundred feet in altitude, and drained by the *Amazon*, the *Orinoco*, and the *La Plata*, with their tributaries. There are three highlands, two—the *Guiana Highlands* and the *Brazilian Highlands*—in the east, and the great western *Cordillera*, or *Andes Mountains*, which extend the full length of the western coast. (See Fig. 342.) Some of the peaks of the Andes exceed 20,000 feet in altitude, and are the highest mountains in the Western Hemisphere. Over six per cent of the continent has an altitude of more than 10,000 feet, a proportion of high land exceeded only in the continent of Asia.

The Cordillera. The Cordilleran Highland of South America is much narrower than the great highland of North America, and is unbroken by water gaps. There is only one railway line between the countries of the eastern and western coasts, and the passes which can be readily used in travel or trade are few.

In northern South America the Andes Mountains consist of an eastern and western range, separated by the valley of the Magdalena River. South of the equator the mountains increase in altitude and are bordered on the east by the great plateau of *Bolivia*. Some of the peaks in this region are volcanic; the best-known volcanic peaks are *Chimborazo* and *Cotopaxi*. (See Figs. 69 and 344.)

The Bolivian plateau contains a large area of interior drainage, in which lies the great



FIG. 341. *The position of South America among the continents. North America is the only land mass near by.*

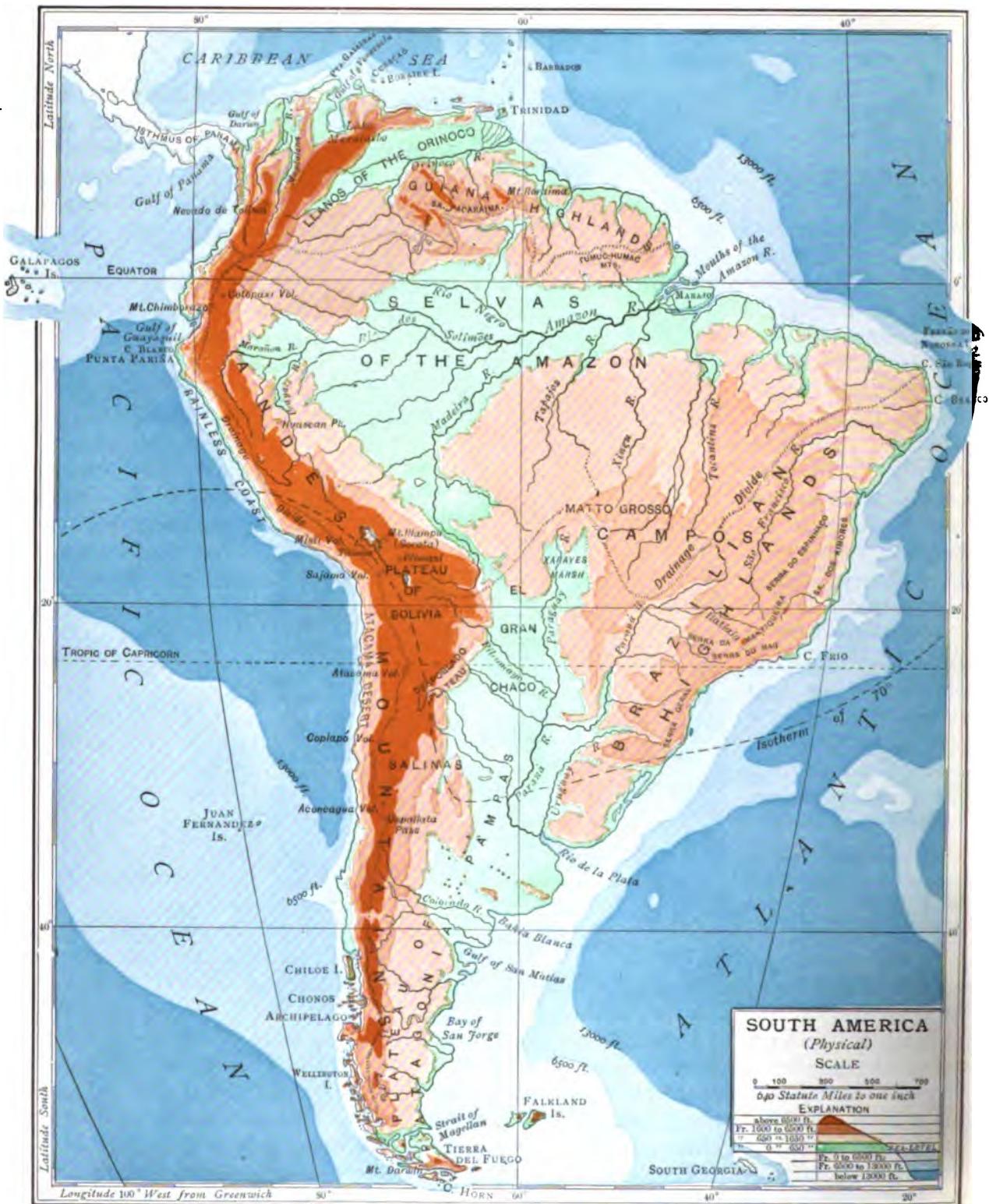


FIG. 342.

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lake *Titicaca*, at the altitude of 12,500 feet. (See Figs. 345 and 367.) The two principal mountains of this plateau are *Sorata* and *Illimani*. High peaks extend south into Chile, where *Aconcagua*, the highest mountain of the Western Hemisphere, is found. The southern Andes have been glaciated and have been partially drowned, forming the fiored coast already mentioned.

In the extreme south the mountains slope off into the plateau of *Patagonia*. This plateau contains a considerable area of interior drainage. (See Fig. 343.)

The Brazilian Highlands. The Brazilian Highlands occupy a large portion of southeastern Brazil. The mountains rise to their greatest altitudes close to the coast, where some of the peaks reach a height of over 10,000 feet. The largest rivers rise on the highlands and flow down the long slopes toward the north and the west.

The Guiana Highlands. The Guiana Highlands occupy the larger part of Guiana and of Venezuela and Brazil south of the Orinoco. The highest peaks rise to over 8,500 feet.

Rivers. The large rivers of South America all lie in the great plains and flow into the



FIG. 345. *Lake Titicaca, one of the few large lakes in the world at a high elevation.*

Atlantic, as do nearly all the great rivers in the world. These rivers are important routes of commerce. The *Orinoco* is navigable for nearly a thousand miles, the *Amazon* for 2,600 miles; the basin of the *Amazon* contains 50,000 miles of navigable streams.

The *Paraná* and *Paraguay* rivers, which together with the *Uruguay* form the *La Plata*, are navigable into Brazil, but are interrupted in their head-waters by rapids and falls. (See Figs. 347 and 348.) The

Paraná and *Paraguay* rivers are important for their commerce, however, because they lie in the most productive temperate region of the continent. The only large river on the western side of the Andes is the *Magdalena*, which drains a large part of the interior of Colombia and flows into the Caribbean Sea.

Climate. The whole of South America, from the north coast to the southern tropic, is swept by the trade winds during the year. In the southern summer, when the Heat Equator is south of the equator in Brazil, the winds blowing in toward this region on the northeast and southeast bring much moisture, which falls as heavy rain. (See Fig. 97.)

Heavy rainfall at this season occurs on both sides of the Brazilian Highlands. The southern slopes are watered by the southeast trade winds, while the northern slopes receive



FIG. 343. *Along the rocky and precipitous coast of Patagonia.*



FIG. 344. *Cotopaxi, one of the most famous peaks of the Andes.*



FIG. 346.

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much moisture from the trade winds that blow in from the northeast.

The northeast trade winds, moving up the Amazon Valley, produce a heavy rain throughout the valley, with the maximum on the east slope of the Andes, where the higher altitude causes increased precipitation. A heavy rainfall occurs on the Guiana Highlands also. All these regions have over eighty inches of rain a year, but the heaviest fall is found on the northwestern coast, where it reaches a maximum of more than one hundred and sixty inches.

The western coast from Guayaquil to Valparaiso, being in the lee of the mountains, receives a very slight rainfall, in some places below twenty inches and in others less than ten inches. South of Valparaiso the western coast is swept by the prevailing westerlies, and hence receives considerable rain, with the heaviest precipitation in the winter. The dry regions in these latitudes are found in the east in the lee of the Andes, and extend to the coast from Bahia Blanca to the Strait of Magellan.

Distribution of Vegetation. The distribution of vegetation here, as in other continents, follows closely the distribution of rainfall. The dry southeastern section is occupied by dwarf plants. North of this region, near the estuary of the La Plata, grassy steppes

are found, with dry steppes farther west at the foot of the Andes where the moisture is less. The grassy steppe or *pampas* region has trees only along the streams. Farther north evergreens are found near the coast, and subtropical palms grow abundantly in the *Gran Chaco*.

Southern Brazil lies in the savanna area and is known as the *campos*. The area is occupied by tall grasses, while farther north cocoanut palms are found. The plateau lying west of the Brazilian High-

lands, known as the *Matto Grosso*, or *Great Woods*, is really in the savanna area, but the increased altitude causes a heavier rainfall so that forests abound.

The Amazon Valley is mostly a tropical jungle commonly called the *selvas*, and contains the densest vegetation on the globe. Palms, figs, and bamboos are the characteristic trees, around which enormous creepers twine, and from the branches of which beautiful orchids hang. North and west of the Orinoco, and in the plains of Colombia, is another great savanna area with tall grasses and isolated trees, and known as the *llanos*.

On the west coast tropical forests abound in the north, while the desert of *Atacama*, in the lee of the Andes in the trade-wind area, is practically without vegetation. In the



FIG. 347. *The Parana River, Argentine Republic, showing a river steamer.*



FIG. 348. *Victoria Falls, Iguazu River, Brazil.*

extreme south dense forests of evergreen trees occupy the western slopes. This forest region grades into a desert region on the north, and on the south into the dwarf trees and bushes characteristic of cold areas.

On the high mountains there is of course a great range of temperature and moisture, and hence of vegetation. In Ecuador and Peru one can find, by going up 12,000 feet, all the characteristic forms of vegetation common in the tropical, temperate, and polar regions.

Animals. South America is a separate animal region, and has already been described. (See page 75.)

Among the valuable animals are the *alpaca*, the *llama*, and the *vicuña*. The llama is used as a beast of burden, and the vicuna and alpaca furnish valuable fibers. Horses abound in the pampas and llanos, and cattle are raised in great numbers in the wetter, and sheep in the drier and cooler southern grasslands. (See Fig. 349.)

People. South America has the smallest population of any continent except Australia. The natives are mostly Indians; some of them are very primitive, using practically no tools or implements, and having no culture. Some of the tribes in the basin of the Amazon are even cannibals.

Europeans are found throughout those sections of the country which have the most favorable climate for agriculture and grazing.

Portuguese are particularly numerous in Brazil, and Portuguese is there the national language. Elsewhere, Spanish is generally spoken. The Spaniards are the most progressive and important people, and occupy



FIG. 349. Cattle grazing on the level slopes of the Argentine Republic.

nearly all the other countries of the continent except the Guianas.

Questions and Exercises

(1) When it is noon at Pittsburg what time is it at Guayaquil? (2) When it is noon at Rio de Janeiro what time is it at your home? (3) How does the width of the continental shelf on the east coast of South America compare with that on the east coast of North America? (4) What islands off North America are similar in position to the Falkland Islands? Galapagos Islands?

(5) Compare the highlands of North and South America; the lowlands. (6) How near the Pacific does the Amazon rise? (7) How do the Brazilian and Appalachian highlands

differ? (8) How do the western Cordilleran Highlands in the two continents resemble each other? (9) In what ways are the western coasts of the two continents alike?

(10) Compare the rainfall of Bahia and the Matto Grosso, and account for the difference.

(11) Why should Valparaiso have less rain than Cordoba or Rosario? (12) Give the reason for the desert coast north and south of the Tropic of Capricorn. (13) Compare the rainfall of the western coasts of North and South America, noting similarities and differences. Give causes. (14) What region in South America has features like the Mississippi Basin? (15) Why is the winter temperature of Norfolk, Virginia, so much lower than that of Buenos Aires? (16) What is the annual range of temperature of Lima? Para? Buenos Aires? (17)

What difference do you make in your mode of life in summer and winter that the people of Para would not make?

(18) What region in the United States has vegetation similar to that of the pampas? What is the chief occupation of each region?

(19) Draw a picture to represent Cotopaxi, and show the different vegetation zones from its base to its summit. (20) Write a list of the different vegetation regions of South America and opposite each put the chief plants and animals of that region.



FIG. 350. A salamander, one of the bright-colored reptiles that inhabit the tropical forests of South America.



FIG. 351.

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FIG. 352. Diamond mining in Brazil.

XLIII. BRAZIL

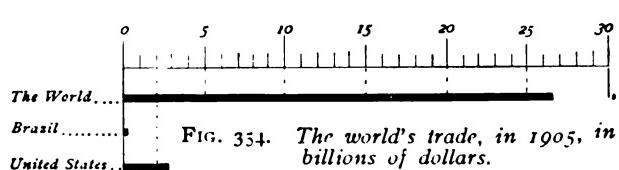
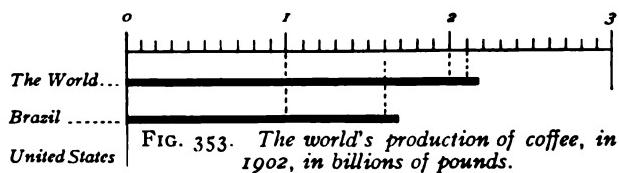
Size and Industries. Brazil is a little larger than the United States, not including the dependencies and Alaska. It lies in tropical and subtropical South America, and is largely occupied by forests and grazing land. There is little cultivated land. The principal agricultural districts are along the southeastern coast and in the highland section just north of Rio de Janeiro. In the drier southern regions there are important colonies of Germans and Italians, who devote most of their attention to grazing, although some manufacturing of woolen goods is carried on.

Products. The highland region north of Rio de Janeiro produces nearly one-half the coffee of the world. (See Fig. 353.) The other important and valuable agricultural products are sugar, cotton, manioc, which forms the principal food of the people, and tobacco.

But the great wealth of Brazil lies in its forests and minerals. Rubber is the most important product of the Amazon region, and cacao is also produced abundantly. Other products are Brazil-nuts and valuable woods.

The more important minerals are gold, diamonds, and iron. Iron is little mined on account of the absence of the coal necessary for smelting, and diamonds are not so important as they once were on account of the much greater and better deposits at Kimberley in South Africa. (See Fig. 352.)

Trade. Brazil has nearly one-third of the commerce of South America, most of which is with the United States, Germany, the United Kingdom, and France. The chief exports are coffee and rubber, though hides and cotton are exported to some extent. Brazil is the chief center of supply for coffee sent to the United States. The imports are food stuffs, coal, cottons, and machinery, for the most part from the United Kingdom and Germany, and wheat and flour from the United States.



The interior trade is largely carried on by boats on the extensive rivers of the country. There are few railroads except in the coffee region. The oceanic trade is largely centered at a few ports. (See Fig. 354.) Rio de Janeiro,

the capital, has a fine harbor and is the chief port. Santos being nearer to the coffee-growing region leads in the export of coffee. Bahia and Pernambuco trade in sugar, coffee, and tobacco.



FIG. 355. Rio de Janeiro, the capital of Brazil.

Questions and Exercises

- (1) Describe the forests of the Amazon.
 (2) Why is the Amazon of less importance commercially than the St. Lawrence? (3)

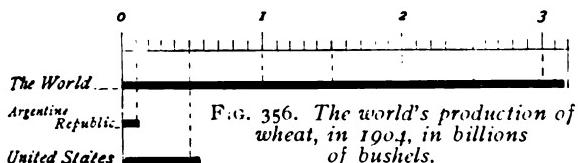


FIG. 356. The world's production of wheat, in 1904, in billions of bushels.

Account for the scanty population of the Amazon Valley. (4) Why are Germans and Italians desirable immigrants here? (5) Make a list of the chief uses to which rubber is put. (6) Consult the temperature maps in this book and find out the summer and winter temperature of the coffee regions.

(7) On an outline map of South America locate the chief towns of Brazil and write their imports. (8) Draw routes between each port and the foreign countries with which it trades. (9) Find out what food stuffs are imported to these towns. (10) What city in the United States is about the size of Rio de Janeiro?

practically uninhabited, and the *Gran Chaco* is occupied by wild Indian tribes. The Argentine Republic is the largest country in the temperate portion of South America, and has, therefore, a better opportunity for future development than any other portion of the continent.

Industry. The abundance of grass on the pampas makes the Argentine Republic a great grazing country, although agriculture is being developed along the lower Parana by settlers from southern Europe. Wheat, flax, and maize are the chief agricultural products; the acre-



FIG. 357. Drying hides near Buenos Aires, Argentine Republic.

XLIV. ARGENTINE REPUBLIC

Size and Surface. The Argentine Republic extends from north of the southern tropic to the extremity of the continent, and includes

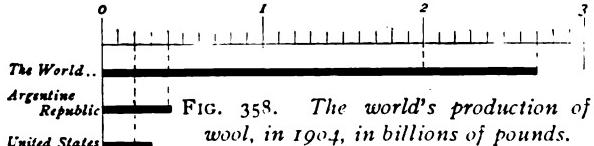


FIG. 358. The world's production of wool, in 1904, in billions of pounds.

part of the island of *Tierra del Fuego*. The area is about a third that of the United States, and is mostly a great plain, broken only by occasional low hills. The southern portion is

age devoted to wheat is increasing rapidly, so that this product is beginning to be exported. There are more than 25,000,000 cattle and more than 75,000,000 sheep in the grazing country, most of them near Buenos Aires.

Trade; Cities. Wool produced in the Argentine Republic is extremely fine and much desired by the manufacturing people of the world. It is natural, therefore, that the Argentine Republic should be, next to Australia, the most important wool-producing and exporting country in the world. (See Fig. 358.)

Frozen mutton is sent to Europe, particularly to the United Kingdom, and live beef

to the other nations of western Europe. Sun-dried or jerked beef is sold to the more tropical countries of South America. These products, with hides, form more than half the exports, which also include gold, silver, and copper. (See Fig. 357.) Iron, steel, and textiles are the chief imports. More than one-fourth of the trade is with the United Kingdom, and nearly one-third with France and Germany.

Interior trade is greatly aided by the fine system of navigable rivers and by railways, better developed here than in any other country of South America. A railroad to connect the east and west coasts of the continent extends to some distance beyond Mendoza, and will finally cross the *Uspallata Pass*, at an altitude of 12,300 feet, by means of a tunnel five miles long.

Buenos Aires, the capital, is the chief port and the largest city of the Southern Hemisphere. Its harbor is not satisfactory because it has to be continually cleared out on account of the silting of the river. *Rosario*, in the center of the agricultural region, will ultimately be an important port, because the river is being deepened so that the city may readily be reached by ocean-going vessels.

Questions and Exercises

- (1) What are the chief reasons why the Argentine Republic is the most progressive country in South America? (2) Tell how the beef from the pampas reaches Sweden; Ham-

burg. (3) What effect on the trade of La Plata will the new Andean Railroad have? (4) Compare the distance Argentine wheat travels in going to Germany with that of wheat from Dakota and Manitoba. (5) Name some of the industries of Buenos Aires that result from its surroundings. (6) What advantages in location has Mendoza? (7) Why does the Argentine Republic trade with Europe?

XLV. URUGUAY AND PARAGUAY

URUGUAY

Climate and Industry

The surface and climate of *Uruguay* are similar to those of the Argentine Republic. Grazing is therefore the principal occupation (see Fig. 360), though agriculture is increasing. Wheat, grapes, olives, and tobacco are raised to some extent.

Trade. The cattle products of Uruguay are exported chiefly in the form of jerked beef and beef extract. Wool is sent to Europe and the United States, and some wheat is exported to Brazil. A large portion of the trade is with the United Kingdom.

Montevideo is the capital and chief city.

PARAGUAY

Surface and Industry.

Paraguay is a rich but undeveloped country largely occupied by Indians. The surface is made up of plains

and low mountains covered by forests. The plains are chiefly devoted to the production of Paraguay tea, or *mate*, and oranges.

Trade. Paraguay tea is cheaper than Asiatic tea and its use in South America is constantly increasing. Lumber is the principal



FIG. 359. *The public square in Buenos Aires.*



FIG. 360. *Grazing on the grassy plains of Uruguay.*

forest product, and is sent to the Argentine Republic and Uruguay, both of which lack timber. These products, together with hides and tobacco are the chief exports. The principal imports are cotton goods, wine, and rice.

Asuncion, the capital, from its position on the Paraguay River, is the most flourishing town and commercial port.

Questions and Exercises

(1) What is the chief article of trade between Paraguay and the neighboring countries? (2) What does Paraguay import from the Argentine Republic? In what parts of both countries does wheat grow; grapes; forests? (3) Give the chief advantages of the location of Asuncion. (4) Why should the Argentine Republic export wheat to Brazil rather than to the United States?

XLVI. CHILE

Chile is a long, narrow country, about as large as California, Oregon, and Washington. It includes many islands and all the land on both sides of the Strait of Magellan. Northern Chile is a desert, and agriculture there is possible only where irrigation is practiced.

Products. The main products of northern Chile are nitrate of soda and guano. The agricultural portion of Chile lies in the coastal area between *Santiago* and *Valdivia*. This portion is the most densely populated; wheat, cattle, and fruits are the chief products. Both temperate and tropical fruits are raised. South of Valdivia the country is forested, and lumbering and fishing are the chief occupations.

Trade; Cities. Nitrate of soda, copper, iodine, and wheat are the leading exports of Chile. Nitrate is far greater than all other exports combined. Wheat is exported to tropical South America to some extent, especially to Peru and Ecuador. Sugar, beer, wagons, and machinery are manufactured to a limited extent, but most of the products are consumed at home. Textiles are the chief imports. The trade is chiefly with the United Kingdom and Germany.

Good roads and railroads are few, and the high mountain wall of the Andes prevents goods from the interior of this portion of South America being exported by way of the western ports. Some trade, however, is carried on with the Argentine Republic over the Andes. Cattle are imported into the country along this route.

Valparaiso, the port of *Santiago*, the capital, is the chief city for imports, and is the most important town on the Pacific coast of South America. *Iquique*, near the nitrate fields, is the chief exporting center. *Punta Arenas*, on the Strait of Magellan, is a calling station for steamers, but sailing vessels usually go around Cape Horn on account of the strong

tides and currents of the Strait of Magellan.

Questions and Exercises

(1) Through how many degrees of latitude does Chile extend? (2) What change in temperature is felt in going from Valparaiso across the mountains? (3) What is the rainfall of the northern part? Of the southern part?



FIG. 361. Transportation in Uruguay. Often six to ten pair of oxen are used to draw heavily loaded wagons across the country.



FIG. 362. Montevideo, showing the quays and the broad harbor.



FIG. 363. Salt works in Chile.

(4) What are the products of the desert region? Of the middle and southern regions? (5) What are the chief articles of trade between Chile and other South American countries? (6) Why is Chile so progressive a country? (7) What language is chiefly spoken in Valparaiso?

XLVII. FALKLAND ISLANDS

Climate and Occupations. The *Falkland Islands* are two small, wind-swept islands lying to the east of the Strait of Magellan. They belong to the United Kingdom and have a great strategic value for that country, because they are a way station on the great western sea route to Australia and India. Owing to their position in the "roaring forties," the climate is damp, though the rainfall is not heavy. There is but little sunshine.

Owing to the lack of sunshine and warmth, practically no trees grow here, but the extensive swamps produce much peat. Sheep are raised in considerable numbers, and some frozen mutton is exported. With the exception of beef and mutton, nearly all the food stuffs have to be imported.

Questions and Exercises

(1) Why are these islands so wind-swept? Tell of the drawbacks there would be to living in these islands. (2) What food stuffs are brought from England? (3) What flowers would grow there? (4) How will these islands be affected by the Panama Canal?

XLVIII. ECUADOR, PERU, AND BOLIVIA

Surface. *Ecuador, Peru, and Bolivia* are extremely mountainous countries. Peru and Ecuador have a narrow lowland on the west and broad tablelands and plains on the east, draining into the Atlantic. Bolivia has mountains on the west and the broadest plateau of the Andes in the east. With the exception of Paraguay, it is the only country in South America which has no coast.

Products and People. The coastal lowland of Peru is dry in the south and has extensive deposits of nitrate of soda, while farther north in Ecuador, owing to the increased rainfall, the land may be tilled. The mountains are high, with few passes, but their slopes are cultivated in places.

The eastern regions of Peru and Ecuador are densely forested. The mountains contain rich deposits of silver, formerly much more important than they are now. The Spaniards, by the early subjugation of the native Incas, secured control of the valuable silver mines of this region. The inhabitants are very largely Indians, but they are intelligent, and far superior to the other Indians of South America.

Trade. Cacao, grown on the lowlands of Ecuador, is the chief export of that country, and is sent to France and Spain, to San



FIG. 364. The Plaza, Riobamba, Ecuador, on market day.

Francisco, and to New York. Panama hats are perhaps the best-known product of this region. They are so named because they have to be carried across the Isthmus of Panama. *Guayaquil* has the best harbor on the Pacific coast. *Quito*, which lies practically on the equator, is the capital of Ecuador and is a very ancient city. Owing to its altitude, it has a delightful climate.

Sugar and metallic ores, cotton, wool, and rice are the chief exports of Peru, though cinchona and rubber are exported in large quantities from the Andes down the eastern rivers. The imports are textiles and machinery.

Interior trade is carried on with difficulty because of bad roads and the lack of railways. A railroad has been built from Lima over the mountains to the silver mines, crossing the Andes at a height of 15,600 feet. Callao, is the port of the capital, Lima, and is the chief city of Peru.

Bolivia is dependent for its trade upon the neighboring countries. Silver, tin, copper, and rubber are sent down the eastern rivers. Some commerce is carried on with the ports of Peru and Chile. La Paz with a population as large as that of Des Moines, Iowa, is by far the largest city. Clothing, textiles, and hardware are imported.

Questions and Exercises

- (1) What advantage would it be to these countries if the Andes were no higher than the Rockies? (2) Show how the Panama Canal will benefit their trade. (3) Draw a diagram cross section to show the difference in vegetation between the east and west slopes of Peru. (4) Down what eastern rivers are the products

from Bolivian mines sent? (5) Find out for whom Bolivia was named? (6) What can you find out about the ancient Inca Indians of Peru? (7) How long are the days at Quito? (8) In what direction would a shadow point in Quito at noon to-day?

XLIX. COLOMBIA, VENEZUELA, AND GUIANA

Development and Climate. *Colombia*, *Venezuela*, and *Guiana* are undeveloped countries, though all are rich in minerals and agricultural lands. *Guiana* is composed of three



FIG. 365. *A sugar plantation in a valley near Bogotá*

colonies held by the United Kingdom, the Netherlands, and France. With the exception of Canada and British Honduras they are the only colonies in the mainland of the Americas belonging to European nations. The climate of all three countries is everywhere hot and moist except in the mountain districts. The lowlands are malarial, while the highlands are healthful. The most dense population is found in the highlands of Colombia.

Products. Cattle are raised in the plains and coffee is grown on the hill slopes. Rice is produced in the lowlands, mostly for home consumption. The crops of temperate latitudes are found in the high plains among the mountains. Sugar is raised in abundance in



FIG. 366. *The city of Cartagena, one of the two large coast ports of Colombia.*

the lowlands of Guiana, and is practically the only product of importance, although it is now giving way to cacao and coffee because the people have found it best not to depend upon one crop only. Rubber, cinchona, and tobacco are produced in Colombia, and cacao is an important product in Venezuela.

Gold and silver are found in all the countries, but the mining industries are best developed in Venezuela and Colombia.

Trade; Cities. Few of the towns of Guiana are important in trade. *Georgetown* leads in commerce, which is carried on mostly with the United Kingdom and the United States. Sugar is the chief export, and manufactured goods and food products are the principal imports. The chief inland towns of Venezuela are *Caracas*, the capital, and *Valencia*.

La Guaira, the port for *Caracas*, the capital, is a cacao and coffee exporting city. Venezuela has practically no railways and few roads. Hence its interior trade is carried on with difficulty, except in the valley of the Orinoco, which is navigable to the foot of the Andes.

In Colombia the Magdalena River is the highway of trade, and *Barraquilla*, at the mouth of this river, is the chief port and town. *Cartagena* once held this position, but its commerce has declined on account of the

silting of its harbor. (See Fig. 366.) *Bogotá*, the capital, is considered the most beautiful city of South America, and is well situated in a rich agricultural country.

Questions and Exercises

- (1) Why should the highlands of these countries have a denser population than the lowlands?
- (2) Upon what products of South America do we depend?
- (3) What are the most progressive nations of South America?
- (4) Locate the chief agricultural regions; mineral regions; grazing regions.
- (5) Write from memory the names of the countries of South America and the chief cities in each.

SUMMARY

South America is, on the whole, unprogressive, except in the countries of the temperate belt and in Brazil. The governments are unstable, revolutions are frequent, and business cannot therefore be carried on successfully. The continent is deficient in railroads and highways, and hence the native riches are not developed. The exports are mostly mineral and cattle products, except in the few scattered agricultural regions. The imports are chiefly food stuffs and manufactured goods, especially textiles and steel. It is anticipated that when the Panama Canal is completed, so that commerce can be readily carried on between the western coast and the large commercial centers of the United States, the continent will develop rapidly.



FIG. 367. *Straw boats used by the natives on Lake Titicaca.*

EUROPE

L. THE CONTINENT AS A WHOLE

Europe and Eurasia. The so-called continent of *Europe* is really a peninsula of the continent of *Eurasia*, but it has so long been considered as a separate continent that we shall treat it as such. We can study the political geography of Europe without thinking much of the greater land mass to the east, but when we consider its climate we shall need frequently to refer to the relation of Europe to Asia.

Size and Position. Europe is the smallest continent except Australia. Its area is only about half that of North America and not much larger than the area of the United States. (See Fig. 28.) It is, however, one of the most important continents because it contains a large number of the leading nations of the world. It extends in latitude over 34 degrees and in longitude over 70 degrees. (See Fig. 369.)

Europe is just across the Atlantic Ocean from the great nations of America (see Fig. 368), and is separated from the continent of Africa by a strait, which at the narrowest point is only eight miles wide. It lies almost in the center of the great land hemisphere, and, partly because of its favorable position, it has long been the leading continent of the world commercially.

Coast Line. Europe has the longest coast line in proportion to its area of any of the

continents. This fact is of great importance, because it has allowed many nations to develop within a small territory, and to have ready access to the ocean. Several of the great peninsulas, especially those along the northwestern and the southern coasts, also have extremely irregular shore lines, and for this reason abound in excellent harbors. (See Fig. 369.)

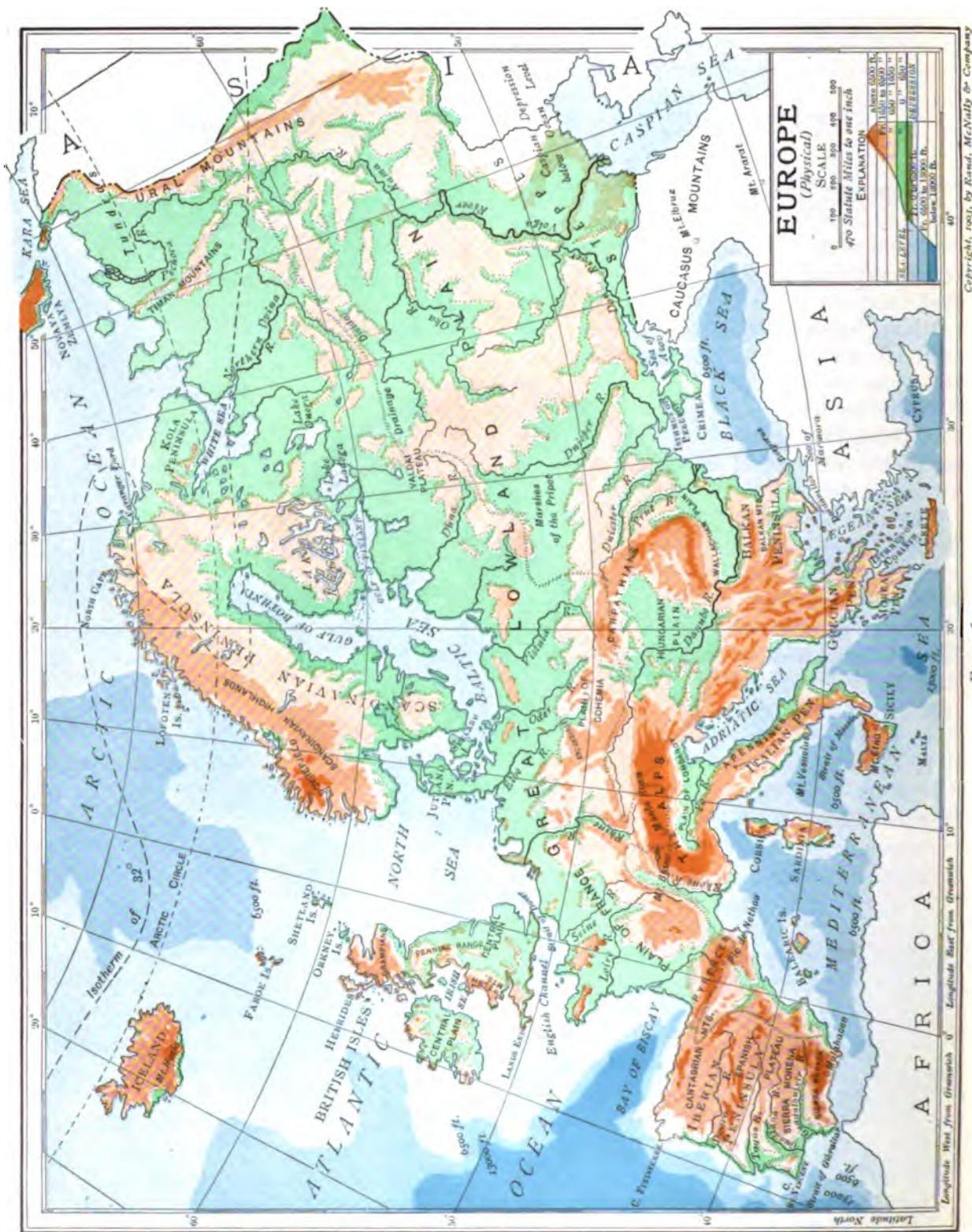
The people living along such a shore naturally became expert seamen and gained the confidence which enabled them to explore the great ocean to the west when they began to look for a new route to the riches of India and the East Indies. It was while endeavoring to find such a route by sailing to the west, that Columbus discovered America.

The Atlantic coast of Europe, from the Bay of Biscay northward, is bordered by a broad, shallow continental shelf, which surrounds the United Kingdom and extends beyond Iceland. It is over the shallows of this continental shelf that the best and most available fishing grounds are found. (See Fig. 376.)

Surface. Europe, like North and South America, consists of two extensive highland areas with a great lowland area lying between them. In northwestern Europe, extending in a broken line from Scandinavia to Ireland, is the lesser highland. It may be compared with the Appalachian Highland in our own continent, and the Brazilian Highlands in South America. The greater highland area



FIG. 368. *The position of Europe among the continents.*



of Europe begins in the mountains of Spain and continues through the Alps, the Balkans, and the Carpathians to the Black Sea. Branches of this highland extend southward along the axes of the several southern peninsulas. It is interesting to compare this area with the Cordilleran Highland of North America and the Andes Mountains of South America. In the Western Hemisphere each main highland extends north and south; in Europe the main divide runs east and west. Between the great highland areas of all three continents is a great lowland. Each of these regions of Europe needs to be studied in detail so that we may know the way in which its features affect the lives of the people living in each area.

The Great Lowland Plain. The larger part of Europe is a great lowland plain, extending from the Atlantic Ocean on the west to the plains of Asia on the east. (See Fig.

369.) Eastern Europe lies almost entirely in this lowland, and its surface is in general rolling, with only a few inconspicuous heights like the *Valdai Plateau*. The northern part of the great lowland has been glaciated and hence contains many lakes, as in Finland, Scandinavia, and the Valdai Plateau. (See Fig. 371.)

The eastern part of this lowland contains many swamps. Across it stretches the natural divide between the long rivers of Europe, the *Volga*, the *Don*, and the *Dnieper*, which flow south, and the shorter rivers, the *Pechora*, the *Northern Dvina*, and the *Düna*, which flow north and west.

It will be noticed that all the long rivers flow into land-locked seas like the Black Sea and the Caspian Sea, and all the short rivers

toward the Atlantic or the Arctic. (See Fig. 369.) This is an important point in considering the comparative value of the trade routes controlled by the different nations.

The Highlands of Scandinavia and the United Kingdom. The *Scandinavian Highlands* rise to an altitude of 8,400 feet, and extend in an unbroken range throughout the Scandinavian Peninsula. These highlands have been glaciated and therefore abound in lakes, while the lower lands are covered with rolling moraines, so that the whole region has a rough, uneven, hilly surface.

The narrow western valleys have been glaciated and then drowned so that the western coast of the Scandinavian Peninsula is one of the most famous fiord regions of the world. The shore line is bordered by many islands, which break the force of the strong waves so that coastwise commerce is possible at all seasons of the year.

The Scandinavian Highlands extend south and west into the United Kingdom, forming the highlands of Scotland, Wales, and northern England. Highlands also skirt the rim of Ireland and nearly surround its central plain. All the highland region of the United Kingdom has been glaciated and lakes abound, many of which are famous for their beauty.

The arrangement of highlands and lowlands in Europe forms a striking contrast to the arrangement of surface features in North America. In Europe the greatest highland runs east and west; in North America, nearly north and south. A corresponding difference in certain features of the climate results.

The Alps. The highest portion of the great highland of southern Europe, which begins at



FIG. 370. *The snow-clad peaks of the Alps. Notice the glacier and the mountain house on the left.*



FIG. 371. A map showing the glaciated areas of Europe.

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the Atlantic Ocean and extends eastward to the Black Sea, is the *Alps*. These extend in a semi-circle from southeastern France to the head of the Adriatic, where they merge into the northwestern end of the mountains of the Balkan Peninsula and Greece.

The Alps contain many large glacial lakes, from which flow the *Rhine*, the *Rhone*, the *Ticino*, and the *Aar*. Each of these rivers gives an opening into the heart of the mountainous country, and is of great importance from the standpoint of travel and trade.

The Alps are so high and so cold, and lie in so moist a region, that they contain many famous glaciers which are more visited than any other glaciers in the world. Ice and perpetual snow cover about 1,400 square miles of their surface, which is an area larger than the state of Rhode Island. (See Fig. 370.) The eastern Alps contain ridges of limestone rock which have weathered into pinnacles and points, giving a striking beauty to the landscape. This region is known as the *Dolomite Alps*, and is far-famed for its scenery.

Mountains of the Iberian Peninsula and Italy.

Southwest of the great highland region is the *Iberian Peninsula*, another distinctly highland area, composed in large part of a plateau broken by many short, nearly parallel mountain ranges known as *sierras*. The highest of these ranges are the *Cantabrian Mountains*, extending on the north to the *Pyrenees*. The Pyrenees form an important natural barrier between Spain and France. (See Figs. 372 and 374.) The only lowlands in this area are found in narrow belts along the eastern coast and along the lower courses of the rivers which flow out from the plateau to the Atlantic Ocean.

South of the Alps lies the *Peninsula of Italy*, which is largely made up of the *Apennines* and the volcanic heights along the western coast. (See Fig. 373.) The mountains are so close to the sea that the rivers of Italy are all short, except the *Po*, which drains the great plain between the Apennines and the Alps. Italy also contains the well-known volcano, *Mount Vesuvius*, and south on the island of Sicily is *Mount Etna*, almost equally famous.

Highlands of France. The *Central Plateau* of France, which may be considered a part of the great highland of Europe, consists of a series of old, worn-down mountains, above which rise many cones of extinct volcanoes. This region forms the divide from which radiate the *Seine*, the *Loire*, and the *Garonne* rivers. The Central Plateau is bordered on the east by the *Cévennes*, which face the valley of the Rhone in a steep and continuous cliff. To the northeast are the *Ardennes* and the *Vosges* mountains, which are separated from the highlands of Germany by a valley similar to that of the Rhone. In this valley the *Rhine* runs for a part of its course.

The Carpathian, Balkan, and Ural Mountains. The eastern portion of the great highland of Europe is made up of the *Carpathian Mountains* which bound the plain of Hungary on the north and east. These mountains are separated from the highlands of the Balkan Peninsula by the narrow pass of the Danube known as the *Iron Gate*.

The Balkan Peninsula is a mountainous country throughout. The northern portion,



FIG. 372. The highest peaks of the Pyrenees, showing flocks grazing on the lower slopes.

which extends east to the Black Sea, is mostly occupied by the *Balkan Mountains*. Highland ridges also extend south through Turkey and Greece. It is the nearly drowned peaks of the southeastern ends of these highland ridges that form the many islands of the

great archipelago of the *Aegean Sea*. (See Fig. 369.)

Bounding Europe in part on the east is the ridge of the *Ural Mountains*. These are more a rise of land than a mountain range, and form



FIG. 373. In the mountainous district near the western coast of Italy.

distinct features in the landscape only in the northern and southern parts of their course.

Climate and Vegetation of Europe. The whole of Europe north of the Alps and the Carpathians is in the track of the westerly winds throughout the year. (See Figs. 82 and 84.) Northwestern Europe lies directly in the path of these winds blowing from the Atlantic. It has for this reason a more even climate than eastern Europe, which lies nearer the interior of the great land mass of Eurasia and is subjected to the great seasonal range of temperature characteristic of regions situated at a great distance from the ocean.

Europe is fortunate in that its greatest highland extends east and west. If it ran north and south along the western coast, as do the highlands in North America, all central and eastern Europe would be a dry steppe like the great plains east of the Rocky Mountains in the United States. With the highlands running east and west, the moisture-laden winds from the Atlantic Ocean are free to sweep eastward and carry a moderate amount of rain to the central and eastern portions of the continent.

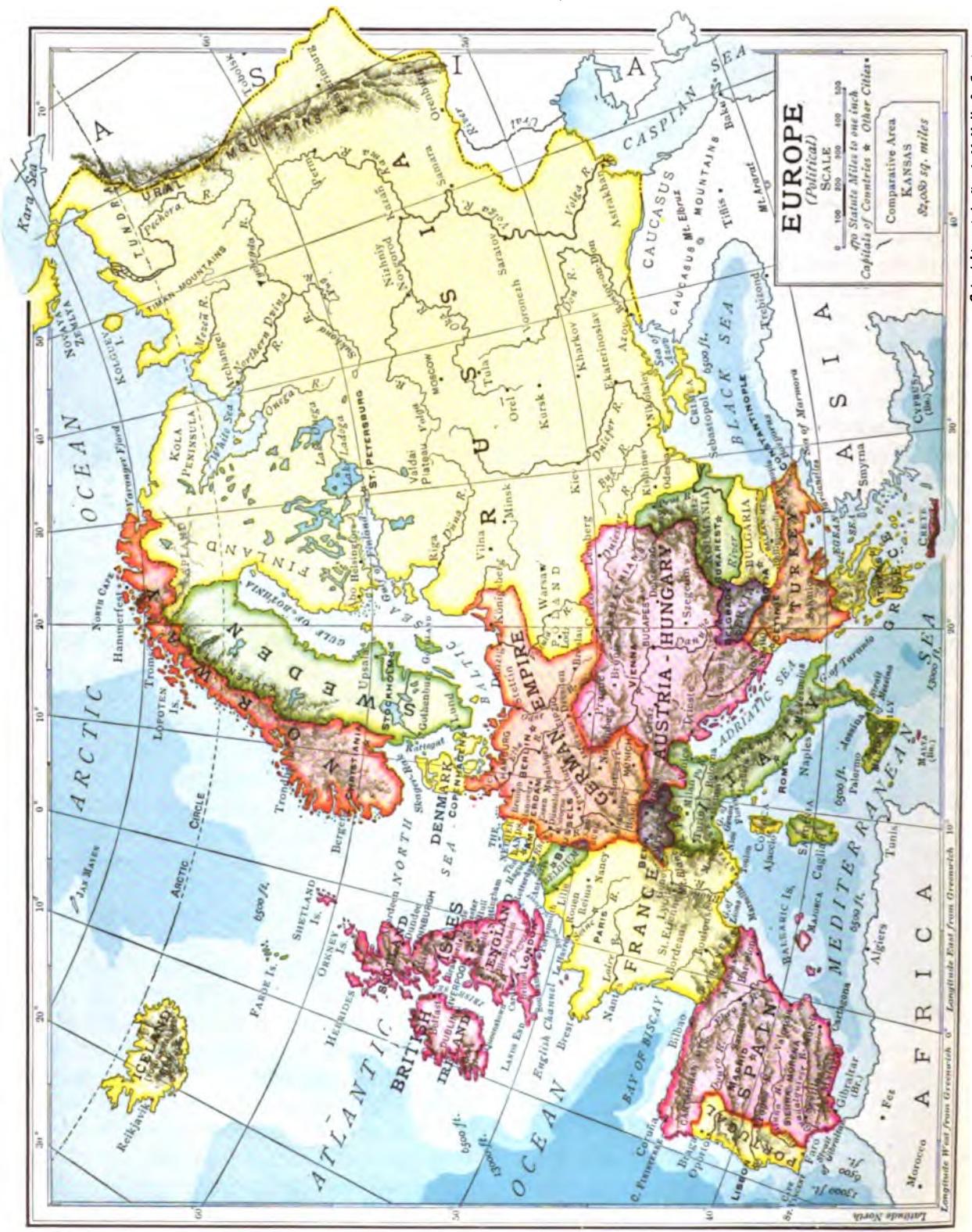


FIG. 374.

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Southern Europe is swept by westerly winds in winter, when the wind system of the world has moved far south. In summer it lies in the northern trade-wind belt when the wind system is farthest north. (See Fig. 84.)

In each of these three divisions of Europe—the northwestern, the eastern, and the southern—the arrangement of highlands has an important influence upon the climate, and the climate, of course, affects the distribution of vegetation and industries. For this reason we need to study the climatic conditions of the three great divisions in some detail, in order that we may understand the distribution of vegetation and of those industries which depend upon the products of the soil.

Northwestern Europe. Owing to the proximity of the ocean and to the fact that the continent is cooler than the ocean in winter and warmer than the ocean in summer, the annual range of temperature along the

northwestern coast of Europe is very slight. The cold winter winds come from the northeast, but they blow for a short time only, and are not so severe as the winds that reach the eastern coasts of North America from the interior of that continent.

The greatest rainfall is in the west, especially on the western side of the mountains of Norway and the United Kingdom. (See Fig. 97.) Here the larger portion of the rain comes in winter, when the moisture, brought from the ocean by the westerly winds, is condensed over the colder land. The moisture and the rainfall decrease to the east, and the crops that can be raised vary accordingly.

The constant moisture of the air of western

Europe is of great importance in determining the kinds of industries that can be carried on. For instance, fibers of cotton do not break so easily when damp as when dry, and fine spinning can, therefore, be done only where the air is always moist, as it is about Manchester, England. The condition of the air which favors cotton spinning does not favor flour milling because wheat grains can be ground fine only when they are dry and brittle. Flour milling is, therefore, more successful in the eastern portion of the continent.

In the west, where the moisture is abundant, potatoes are largely cultivated. The warmth of certain parts of this area is sufficient for the grape to be produced as far north as the valley of the Moselle. Oats and barley, which also can be raised where the moisture is abundant, are found in the northwest, while wheat, which requires an abundance of sunshine, is found more

particularly in southern Italy, France, and Germany. Rye and flax are grown in the center of this climatic area.

The distribution of forest trees also varies according to the climate. In the north, especially in Scandinavia, the trees are mostly cone-bearing and evergreen. Toward the south some of the trees are deciduous and some evergreen, while in the extreme southern part of the area, as in similar regions in the United States, only deciduous trees, like the beech, oak, elm, ash, and maple, are found.

The extreme northern portion of this area merges into the *tundra* region with its extensive bogs, in which many flowers bloom luxuriantly in the short summer, but which are practically devoid of trees.



FIG. 375. *A Laplander with his reindeer.*



Eastern Europe. In the broad plains, or tundra, of northeastern Europe the winters are severe. The climate is comparatively dry, because the winds have lost a large part of their moisture on the western highlands, and because the winter winds, blowing from the land rather than from the water, carry but little moisture.

Just to the south of the tundra is a forested belt containing cone-bearing trees, while south of the isothermal line of sixty degrees (average summer temperature) is the *black earth* and *steppe* region, which becomes increasingly dry to the southeast. Here abundant grasses are found and grazing is the chief industry. (See Fig. 119.)

Southern Europe. In winter the almost continuous wall formed by the Pyrenees, the Alps, and the Balkan Mountains prevents the cold winds of the interior from reaching southern Europe, which has in general a warm and balmy winter climate. The summers are practically rainless, and sunshine abounds. (See Fig. 84.)

Wheat and maize, both of which require prevailing clear weather, are the principal grains grown here. The character of the climate is best shown, however, by the extensive areas devoted to subtropical fruits, like figs, pomegranates, grapes, oranges, lemons, and olives.

In summer the high valleys of the Alps become health and pleasure resorts, while the southern shore of France and the northwest coast of Italy, which are protected from the cold continental winds of winter, are much frequented in the winter season.

Distribution of Animals. The animals of Europe are distributed according to climate and vegetation. In the north the fur-bearing animals are found in great numbers. Here also are the reindeer which subsist upon the reindeer moss, one of the characteristic plants of the tundra area. (See Figs. 168 and 375.)

In the western rainy region and in the mountain valleys, where grass is abundant,

great numbers of horses and cattle are raised. Sheep thrive in the southeast where it is drier, and goats are also found in large numbers in the south and southeast. In the driest parts of southeastern Europe, as in that portion of Asia lying to the east and southeast, many camels are used.

The People of Europe. Europe is the most densely and completely inhabited of all the continents of the world. It is divided among many nations. The larger number of the people belong to the *white race* and the remainder to the *yellow race*.

The people about the Mediterranean Sea belong to the dark division of the white race. Most of them have dark hair and eyes and narrow heads, as we see in the Italians and the Spaniards, and speak languages that are somewhat alike. (See Fig. 156.) In the extreme north the people are fairer, with blue eyes, as is well illustrated by the Swedes. In Turkey, Finland, and in southeastern and northern Russia the native inhabitants for the most part belong to the yellow race, with the oblique eyes which characterize that people.

The languages which the people of Europe speak are various. Not only has almost every nation a distinct language, but many include several languages. Indeed, in some nations there are so many dialects that the people from one section can hardly understand the people from another part of the same country. With the increase in commerce and travel which has been so prominent in the last century, men have generally learned to speak more than one language, so that now one can travel in almost any part of Europe and be readily understood if he can speak either French or English.

Questions and Exercises

- (1) Between what degrees of latitude does Europe lie? (2) What city in North America is in the approximate latitude of Gibraltar? Of London? (3) When it is noon at London what

time is it at Ottawa? At Valencia, Spain? (4) How many hours ahead of noon at Lisbon is noon at Peking? (5) Which is the longer, a January day at Paris or at Vancouver; at Naples or at Pittsburgh? (6) Compare the length of a day in June at your home and at Edinburgh; at your home and at St. Petersburg.

(7) On an outline map of Europe write the names of the bays and seas. Locate the chief seaports and opposite each write its name. (8) Which countries have little coast line? Which have a long coast line? Which have none? (9) Which country of Europe is most favorably located for carrying on trade? (10) How is Russia hampered in the development of her commerce? (11) Why is not Norway, with her deeply indented coast, one of the most important countries commercially?

(12) On a map of Europe trace the divide between the rivers flowing north and those flowing south. (13) On the outline map used in Exercise 7 draw the chief rivers and write their names. (14) Fill out the following chart:

RIVERS OF EUROPE EMPTYING INTO				
Atlantic Ocean	Mediterranean Sea	Black Sea	North Sea	Baltic Sea

(15) Write in one column the names of the chief highlands of Europe, and opposite each the names of the countries they are in. (16) Locate Mont Blanc; Mount Etna; Mount Vesuvius. (17) Name and locate three active volcanoes. (18) On an outline map of Europe draw a dotted line separating approximately the region of moderate rainfall from the region of light rains. Write on the map the names of the countries that have a moderately heavy rainfall. (19) Draw a second dotted line separating those countries that



FIG. 377. Looking over the English lowlands, called "downs."

have dry summers and winter rains from the others, and write the names of these countries on the map. (20) Why does eastern Europe have light rains while the eastern United States has moderate and heavy rainfall? (21) Which section has the greatest range of temperature? The least?

(22) Compare the annual range of temperature of Lisbon and San Francisco; of Moscow and Winnipeg. Account for this. (23) Why do the coldest winds come from the *east*? (24) What influence have the Alps on the climate of southern Europe?

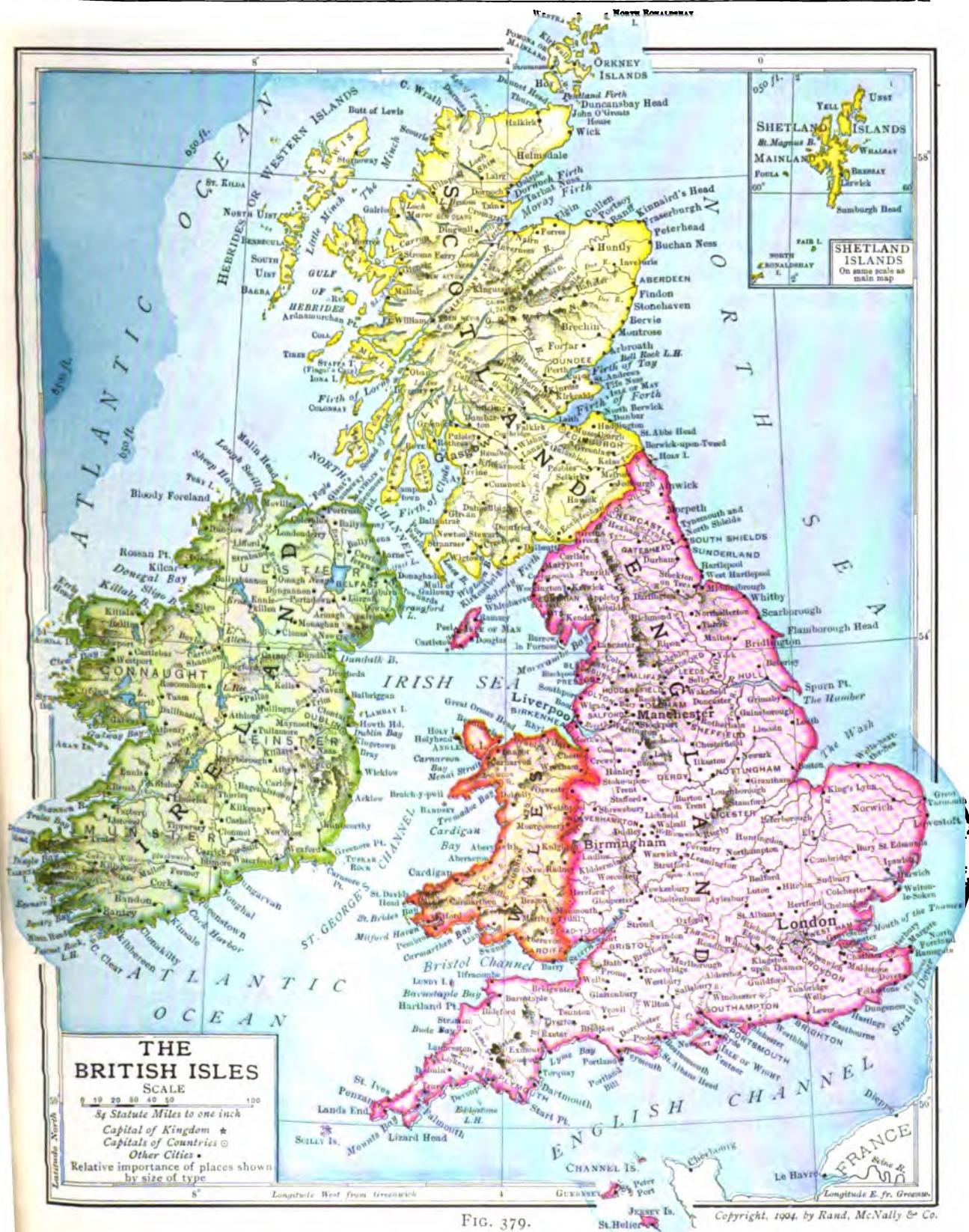
(25) On the outline map used above color the tundra region and write the names of the plants and animals found there; do the same for the subtropical region; write the names of the chief vegetation products of the uncolored portion of the continent. (26) Draw the isotherms of sixty and seventy degrees average summer temperature and locate on the map towns having this temperature.

LI. THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND

The "Mother Country." The country of Europe with which our own country is most closely connected is the *United Kingdom of Great Britain and Ireland*, known geographically as the *British Isles*. It includes *England*, *Scotland*, *Wales*, and *Ireland*, and is known as the United Kingdom. We commonly call this country the "Mother Country" because the United States has grown from a group of colonies formerly belonging to it. Its total area is nearly as great as that of the New England



FIG. 378. Glenariff, Ireland, where the highlands and lowlands meet.



States, New York, and New Jersey. The population of the United Kingdom in 1901 was something more than half the population of the United States in 1900. Such a large population concentrated in so small an area means, of course, that the density of population is great, and that there is not room enough to raise all the products necessary to feed and clothe the people and make them comfortable. The average density in England and Wales is over 550 to the square mile.



FIG. 380. *Loch Lomond, Scotland. Notice the mountainous nature of the district.*

The United Kingdom is but a part of the great country known as the *British Empire*, which includes many colonies throughout the world; the most important of these are *Canada, India, and Australia*. (See Fig. 382.)

An Island Kingdom. The United Kingdom has not only the greatest number of colonies of any country in the world, but it is the most important country for its commerce. This is largely due to its position on a group of islands with an irregular coast line and situated at the center of the land hemisphere. To the east are the great nations of Europe, needing the supplies of the world at large, and on the other side of the Atlantic is our

own country with its wealth of food materials far surpassing the needs at home. For this reason the United Kingdom has had a greater opportunity for commerce than any other nation of Europe. With no land frontier which must be protected, the nation has been free to devote its attention to manufacturing, shipping, and trading.

Coast Line. An elevation of the sea bottom around the United Kingdom, not to exceed six hundred feet, would make all this territory a

great peninsula of Europe. (See Fig. 369.) The trade conditions would then be far different. The drowning which has separated these islands from the rest of the continent of which they are a part has also given the kingdom a large number of excellent harbors on all sides, and especially on the west. Its coast line is long, and it is so indented by inlets that there is no

place within the kingdom more than seventy miles from the sea. This makes it possible for the products of any region to be carried to the sea at small cost, and the products of other countries can easily be shipped to the places where manufacturing is carried on.

Surface. Highlands, as we have already seen, occupy most of the surface of Scotland, of northwestern England, and of Wales. A small but important lowland of fertile, agricultural soil crosses Scotland from the Firth of Forth to the Firth of Clyde, while another and far larger lowland area occupies the greater part of England. Ireland also is a lowland surrounded by low mountains.

The Distribution of Industries. Western England, because of the extremely rugged character of its surface and its abundant rainfall, and because of the great mineral wealth of its highlands, is naturally devoted largely to stock raising and to mining. The warm, moist climate and the fertile soil make the raising of sheep and the cultivation of grass and field crops the leading occupations of the rural districts in the lowlands to the east and southeast.

Climate. The climate of the United Kingdom may be described as *oceanic*; that is, it is largely determined by the fact that the country is surrounded by the ocean. The annual range of temperature is small, varying not more than 20 degrees over the larger part of the country. There is an abundance of rainfall.

Owing to the favorable climate, outdoor work can be carried on the year round in the lowlands. Southwest Ireland has a winter

temperature as high as that of central Italy.

The distribution of the rainfall depends upon the winds and the position of the highlands. The western coast is rainy and the eastern dry. In the Isle of Skye the annual rainfall is over 100 inches, while at London it is only about twenty-five inches.

The easterly winds are cold in winter, as they blow from the cold continent of Europe, but the mountain ranges like the *Pennines*, running through the center of the country, protect the region to the west. This accounts in part for the warmth of the winter climate about Manchester.

The title of *Emerald Isle*, which is sometimes applied to Ireland, suggests the green-

ness of the grass due to the warmth and moisture of the climate. The greatest amount of sunshine is on the coast, where the raising of wheat and barley is consequently of most importance. The extensive bogs formed by the glacial lakes furnish an abundance of peat for fuel. (See Fig. 383.) The swamp vegetation grows rapidly, owing to the moist climate.

Products of the Soil. The warm, moist climate and the fertile soil make the plains and valleys of the British Isles an exceptionally fine farming country, and the hills and more rugged slopes furnish pasture for cattle and sheep. Two-thirds of the area of the United Kingdom is in grass, and agriculture and grazing are therefore the leading rural industries. But manufacturing and mining are so much more important that there are five times as many people in the mines and shops as are engaged in agriculture.

Oats are produced in the moist and cooler west and north, while

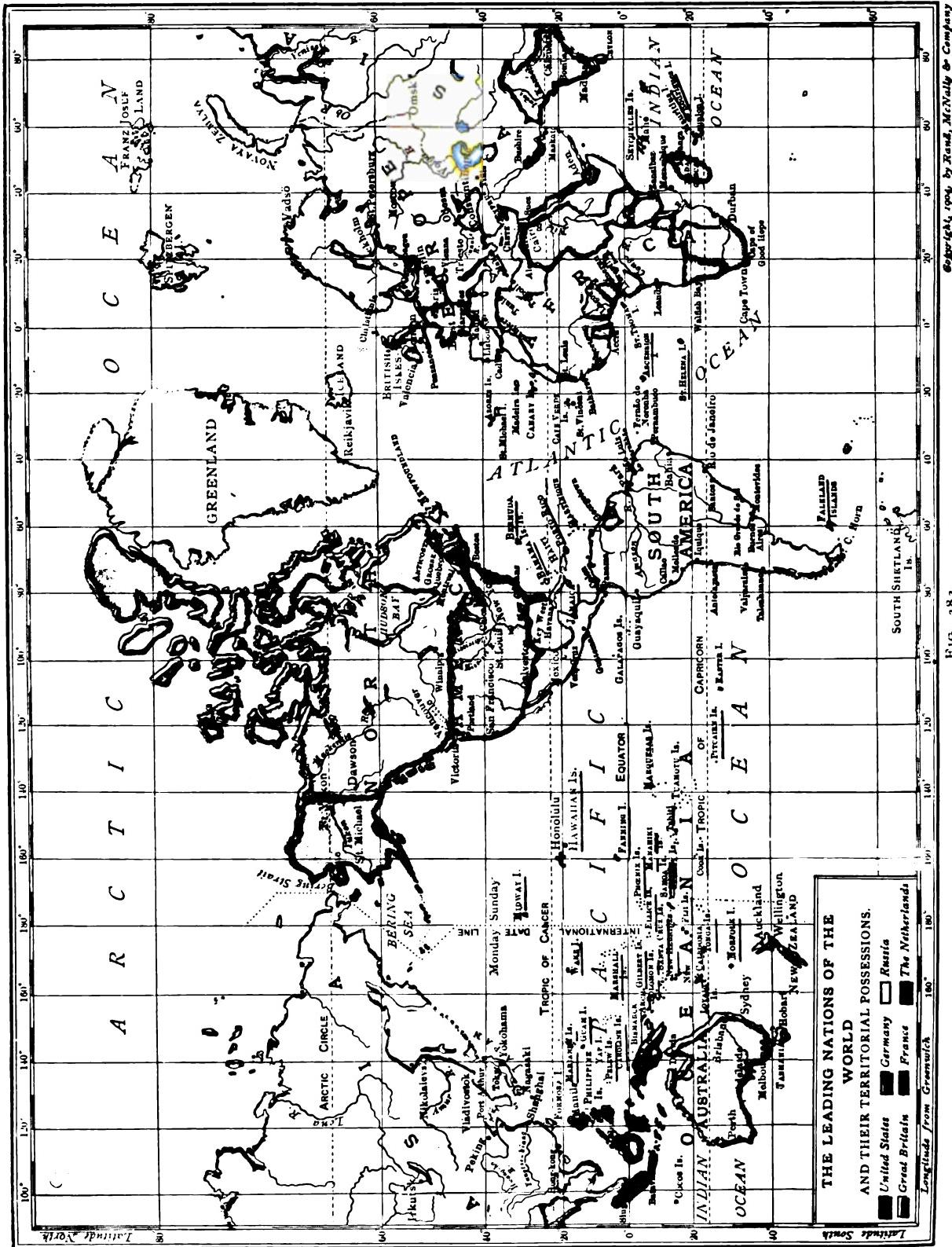


FIG. 381. Small glen, Scotland, showing a road following the winding valley.

barley and wheat, which need more sunshine, are raised in the south and southeast near the coast. Large quantities of garden vegetables are grown in Wales and Ireland. Turnips are the leading vegetable in Ireland and in Scotland, while hops for the local breweries are raised in the southern part of England. Flax is an important crop in Ireland, where it is made into the famous Irish linen.

Cattle are extensively raised for beef, butter, milk, or cheese, which are largely sent to the principal cities. The sheep of Scotland make the best mutton and those of southern England produce the finest wool.

In spite of the richness of the soil, however, the United Kingdom does not produce enough



food for its own people or sufficient wool for its numerous and extensive manufactures. This is exactly what we should expect in any country where only one person in six is engaged in tilling the soil.

Mineral Products.

Coal and iron are the principal minerals; tin is found in England in valuable quantities, and slate, granite, salt, and pottery clay are common in certain regions. The United Kingdom was the largest producer of coal until 1898, when it was surpassed by the United States. It is still the second coal-producing country of the world. It also ranks third in the production of iron, being exceeded by both the United States and Germany. (See Figs. 384 and 385.)

The coal and iron of the United Kingdom are found close to deposits of limestone, which is necessary for the purification of the iron. England especially has large deposits of coal and iron near each other and is, therefore, well fitted to become one of the leading manufacturing countries of the world.

Coal is found principally in the valleys of the *Clyde*, *Severn*, and *Trent* rivers, about *Durham*, and in *Lancashire*. The coal fields of the coast are large centers of shipbuilding, while the interior coal fields are centers of woolen and cotton manufacturing. Great quantities of coal are sent to other countries as ballast in vessels which bring

back the necessary food products and raw materials for manufacturing. Coal is the only raw product of the United Kingdom which is produced in greater abundance than is needed for home use. It is sent principally to those countries on the continent of Europe which are lacking in fuel.

Fisheries. The nearness of the British Isles to the great fishing grounds of the North Sea and of Iceland, combined with its deeply indented coast and large manu-

facturing population to be fed, has made fishing one of the great industries along its coast. More than 100,000 people of the United Kingdom are thus engaged, and fish is the only food product of the region which is adequate to the demand for it. In fishing, the United Kingdom is second only to the United States in importance. *Hull*, *Harwich*, and *Yarmouth*

are the principal fishing centers, but all the coast towns contribute to this industry. The fishing vessels go far out into the Atlantic, many of them even to the shores of Iceland, though the chief fishing grounds are over the Dogger-Bank in

the North Sea. Haddock, herring, cod, and mackerel are the chief food fishes, and herring are exported in large quantities.

Manufacturing. The British Isles are situated midway between the great land masses of the world. Raw products can be brought



FIG. 383. *Interior of a cottage in Ireland. The grate burns peat.*

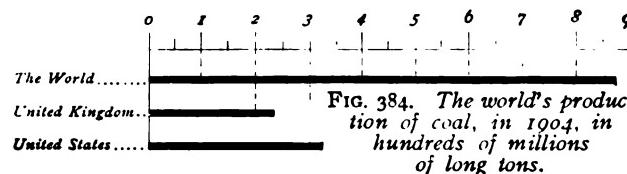


FIG. 384. *The world's production of coal, in 1904, in hundreds of millions of long tons.*

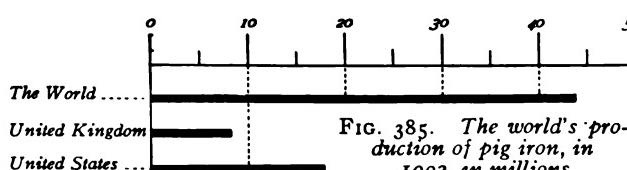


FIG. 385. *The world's production of pig iron, in 1902, in millions of long tons.*

to them easily and cheaply by water and then shipped to other countries as manufactured products. There is no land border to defend, and the people have been free to devote themselves to the development of their industries. All these natural advantages combined for many years to make the United Kingdom the leading manufacturing nation of the world, but now it is second to the United States. Owing to the conditions of moisture and temperature and the excellent supply of coal and iron, cotton, woolen, and steel manufacturing are the chief forms of this industry. More than 1,000,000 people are engaged in cotton and woolen manufacturing, chiefly in or about the large cities which have grown up near the coal and iron fields.

Owing to the favorable climate, the greater part of the cotton manufacturing is carried on in Lancashire. The chief manufacturing cities are *Manchester*, noted for its cotton, and *Leeds* for its woolen goods. *Birmingham* makes railroad iron and supplies, and *Sheffield* is known the world over for its cutlery.

Spinning is important near the flax fields of Ireland, especially at *Belfast*.

The famous *Paisley* thread is made in southern Scotland.

The great shipbuilding center is on the Clyde. *Glasgow*, Scotland, is the chief city for this industry.

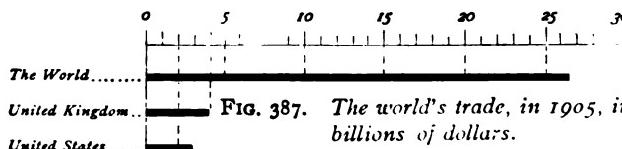
Trade. Owing to its wealth of manufactures and to its situation, the United Kingdom has an enormous trade with all parts

of the world. In fact it carries on about one-fifth of the total trade of the world. (See Fig. 387.) The larger part of this is centered at the ports of *London*, *Liverpool*, *Hull*, *Southampton*, *Cork*, and *Glasgow*. The coast and the interior trade also are very large because the country is well supplied with railroads and the more important navigable rivers are connected by canals.

London, with its magnificent natural harbor afforded by the estuary of the Thames, was preëminently fitted to become the leading commercial city of the world. It is situated almost at the center of the Land Hemisphere; to the east are the thickly populated nations of Europe, which cannot supply their own needs; to the west is America with its abundance of raw material; behind it are the great manufac-



FIG. 386. *The Houses of Parliament, from the rear. The laws of the Kingdom are made here.*



ing cities of England; and what is more, it is the capital of the richest and most powerful empire of to-day. All these advantages combined have made London the leading center of trade and the most populous city in the world.

Imports. Nearly one-half the imports into the United Kingdom come from the English colonies

and the United States; more than one-fifth of all the imports are secured from the United States alone. Cattle and hogs, cereals, and raw cotton are imported from the United States in large quantities. Cotton is also secured from India and Egypt and wool is imported principally from Australia and South Africa. The imports from

Australia and South America are very largely animal products.

Exports. The United Kingdom exports more manufactured goods than any other country, and over one-half of the exports are cotton and woolen goods. Cotton goods are sent chiefly to the warm countries of

the world, while woolen goods are sent to the cooler regions like northern North America, Australia, and the Argentine Republic. Only about one-fifteenth of its export trade is with our country, and this consists chiefly of woolens, cottons, and linens. Its export trade with its colonies far excels that with any one country.

London carries on the larger part of the trade with the eastern countries, while *Liverpool* leads in the trade with the United States. *Hull*, owing to its position, is an important port for commerce with the countries of northern Europe. *Cardiff* and *Newcastle*, because of their proximity to the rich coal fields, are the two leading coal-exporting cities of the world. Other cities are important, but those mentioned are, because of their commerce or their

manufacturing, the leading cities of the nation.

People. The United Kingdom, and especially England, which is the mother country of all the English-speaking peoples the world

over, is in some ways of more interest to us than any other country.

The English people have always been noted for their respect for law, for their ability to adapt themselves to new conditions in new countries, and for their enterprise in developing commerce and manufactures. They have always been progressive and persevering in spite of difficulties. Hence they have won

where others failed and their colonies, planted widely and in regions rich in natural resources, have grown great and wealthy, and have become powerful and important

members of the British Empire.

Geographically at the center of the English-speaking world and closely in touch with all other countries in which the same language is used, the United Kingdom retains its position as the leading commercial nation.

Scenery. Many of the cities and rural districts of the United Kingdom are visited by large numbers of people yearly because of their historic interest, their literary associations, or their scenic beauty. (See Fig. 391.)

London, as the historic capital of the British Empire, is the chief city of interest to the traveler. Here are the *Houses of Parliament*, in which the governing bodies meet, *Westminster Abbey*,



FIG. 388. English cottages at Kenilworth.



FIG. 389. A slow-moving English river at Cambridge.



FIG. 390. Looking over Keswick, England, with the lake and the mountains beyond.

which kings and queens and famous poets are buried, and many other places of equal interest. (See Fig. 386.) Many of the towns of England are noted for their cathedrals.

Old cities like *Edinburgh* and *Stirling*, which have been centers of historic incidents, attract many tourists.

The mountains and the lakes of northern England, southern Scotland, and Ireland are favorite regions with travelers on account of their natural beauty. The Highlands of Scotland afford fishing and hunting.

Questions and Exercises

(1) On an outline map of the world color in red the United Kingdom and its chief colonies. (2) Draw the most important ocean routes which connect the United Kingdom with its colonies and write the names of the bodies of water crossed by these routes.

(3) On an outline map of the British Isles write the names of the chief estuaries; locate a harbor on each. (4) Write in one column the names of the chief seaports that are at or near the mouths of rivers, and opposite each port write the name of the river it is on.

(5) Write a composition on "How the Products of the United Kingdom are Affected by its Climate and Surface." (6) On the outline map used in Exercise 3 draw a line dividing manufacturing England from agricultural England; in each portion write the names of the chief products. Use symbols, or abbreviations if you like, to represent the mineral products. Try to make the map attractive. (7) On this map write the names of the most common fish in the waters in which they are found, and draw arrows from these waters to the chief fishing towns.

(8) What are the advantages of the position of London with regard to England? (9) What continental ports does it face? (10) What ocean routes does it command? (11) Draw a sketch map of London showing the railroads connecting it with the chief towns of England

and Scotland and the water routes connecting it with continental cities. (12) Find out, if possible, how London is supplied with food. (13) On an outline map of England color the chief mineral regions and locate the manufacturing towns. (14) Draw railroad routes from these towns to the ports from which their manufactures are exported. (15) Make a small sketch map of England and show by arrows, or in whatever way you can, the chief exports and the countries to which they are sent.

LII. ICELAND

Surface and Climate. Iceland, the largest island of Europe except Great Britain, belongs to the kingdom of Denmark. (See Fig. 374.) It is about the size of Kentucky and lies

on the edge of the temperate belt. In the south it has a moderate winter climate with an average January temperature like that of New York City and northern Norway. Its harbors rarely freeze. The climate is wet and stormy and agriculture is carried on with difficulty. The island has many highlands in the north, and several vol-



FIG. 391. Prince's Street, Edinburgh. Notice the castle on the left and the monument to Walter Scott in the center.

canoes, geysers, and glaciers that are of considerable interest.

Products. Hay, cattle, and sheep are the leading products. Grass is secured with so great difficulty that it is even planted on the roofs of the houses, where the warmth of the interior secures a good return. The inhabitants are largely distributed along the coast, where they carry on a certain amount of fishing. The sea about Iceland is a good fishing ground and is much frequented by fishermen from western Europe. There is no manufacturing on the island and little mining. The people are not progressive.

Trade. As the roads are poor and as there are no railroads, many horses are raised for use in travel. The inhabitants secure great profit from the eider down gathered from eider ducks, which breed there in the summer, and from the fisheries. *Reykjavik* is the only town of any importance.

Questions and Exercises

(1) Study the map of Europe, especially the ocean, and tell why Iceland belongs to Europe rather than to North America. (2) What

curious custom in Iceland is a result of its climate? (3) How can horses and cattle be raised if hay is grown with difficulty? (4) What fish are caught in the surrounding waters? (5) What countries of Europe send fishermen to Iceland?

LIII. FRANCE

Position and Coast Line. France lies on the windward side of Europe and is separated from the United Kingdom by the narrow *Strait of Dover* and the *English Channel*. Surrounded by water on three sides, it has a long coast line, but unfortunately it has few good harbors, because the coast is so regular.

The great indentations of the sea, the *Bay of Biscay* and the *Gulf of Lions*, are both stormy, and hence commerce along these coasts is conducted at a great disadvantage. The best harbors are those of *Le Havre*, important for its trade with America; *Calais*, the port nearest to the

United Kingdom; *Bordeaux*, which carries on a large trade with South America; while *Marseilles*, the leading port, trades especially with Africa and the rich countries of the East Indies. (See Fig. 376.)

France is fortunate in having a coast line on the Mediterranean, because the United Kingdom controls the *Strait of Gibraltar*, and in case of war could easily prevent French vessels from passing between the Atlantic Ocean and the Medi-

ranean Sea. The total area of France is about equal to that of the New England States, New York, Pennsylvania, and Ohio combined.

France has many foreign possessions scattered over the world; the most important are *Algeria*, the *Sahara* and *French Western Africa*, *Madagascar*, and *French Indo-China*. Most of these possessions furnish many valuable products to the home country.

Surface. Northern and northwestern France lie in the great low plain of northern Europe. The general trend of the slopes is to the west and northwest, and hence the longer rivers run in this direction.

The larger part of central France is a plateau which rises from the valley of the Rhone in the steep wall-like front known as the *Cevennes*. From

this rim the plateau slopes down to the western coastal lowland. This plateau contains the volcanic region of the *Auvergne*.



FIG. 392. Calais, the French port nearest England.



FIG. 393. Bordeaux, along the quays. This port carries on a large trade with South America.



FIG. 394.

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(See Fig. 395.) and the famous limestone cave region of the *Causses*.

In the northwestern peninsula of Brittany there is a small upland region commonly called the *Hills of Brittany*. Along the southwestern coast is a large area of moving sand dunes known as the *landes*. The westerly winds are continually carrying these sands farther and farther inland, and in this way great damage has

been done to the vegetation. This region naturally has a very small number of inhabitants.

On the east are the *Jura Mountains* and the beginning of the great highland of the *Alps* which extends close to the sea east of Marseilles. At the north end of the French Alps is found the highest peak in Europe, *Mont Blanc*, with an altitude of 15,775 feet.

Rivers. The great rivers flow down the slopes to the west or are confined in narrow valleys between the mountain ranges, as is the case with the *Rhone*. France controls the whole of each of her rivers except the tributaries of the Rhine, which flow out between the mountains and through the Netherlands and Germany. Owing to the fact that all the great rivers of France—the *Rhone*, the *Seine*, the *Loire*, and the western tributaries of the *Rhine*—have their sources near together on the Central Plateau, it was very easy to connect the upper courses of these rivers by canals

and thus form a network of waterways crossing the country in every direction. These canals greatly stimulate the interior trade of France.

Climate and Rainfall. Owing to the nearness of France to the sea and to the protection afforded by the mountain barrier on the east, its climate is very even. The climate of the mountains and the plateau is of course more severe than that of the pro-

tected plains to the west and north, and for that reason there is a considerable range of temperature from the mouth of the Loire, where frost is practically unknown, to the perennial snows of the higher Alps.

Owing to the influence of the mountains and the plateau, the rainfall is unequally distributed. The greatest annual rainfall is along the north side of the Pyrenees, where it is about the same as at New Orleans. The least is along the Mediterranean coast, where it is about as great as in eastern Kansas. (See Fig. 97.)

The southern coast east of Marseilles, being protected from the cold northern winds, has become a great winter resort and is known as the *Riviera*. Along the southern coast, however, especially from Montpellier

to Toulon, there is frequently in winter a severe cold wind, known as the *mistral*, which blows down from the *Central Plateau*. This occurs when the air is cold and heavy over the



FIG. 395. A fertile slope on the side of one of the old volcanoes in the Auvergne region.



FIG. 396. Hay-making in eastern France. The Alps are seen in the distance.

plateau and warm and light along the coast. Under these conditions the air moves quickly and the wind may be severe enough to cause a great amount of damage; it has even been known to blow carriages over in Marseilles.

Products of the Soil. France is distinctly an agricultural country, and nearly one-half its people live on farms. On the plains, which extend for about one hundred miles inland from the English Channel, the climate is mild and moist; pastures and orchards abound. In the damp, warm areas of the lower

Rhone and along the southern coasts the olive and the mulberry are raised in large quantities. Silkworms feed on the leaves of the mulberry tree, and hence the production of silk is an important and thriving industry in the southeastern part of France.

Wheat, which occupies one-sixth of the cultivated land, is the most valuable cereal of France, especially in the basins of the Loire and the Seine. The demand for wheat is very great, as the people live largely on white bread, but in spite of the abundance of the crop, only about nine-tenths of the amount necessary for home consumption is raised. Oats are the second cereal in importance. Rye and barley are raised on the poorer soils of the coast and in the highlands. On the plains of the north, where the slopes and soil are favorable, potatoes and

sugar beets are raised in large quantities, especially for making raw sugar and alcohol.

The warm, sunny climate and fertile soil of France combine to make it the greatest grape-raising and wine-producing country in the world. Grapes do not flourish in the north,

but from the Loire southward the vineyards occupy every favorable nook on the warmest and best protected slopes, and give the region an appearance of thrift and beauty. The most important vineyard areas and the leading wine-producing regions are in the east. Wine is

the second largest export of France.

Stock Raising. Cattle raising is extensively carried on, especially among the hills of the northwest. This part of the country produces a large amount of butter, which is sold principally in Paris and London. In Normandy and in southern France a great quantity of cheese is made, of which the most famous kind is *Roquefort*, made from the milk of ewes and cured in limestone caves. (See Fig. 399.) Horses are raised in the north, and from this region come the famous *Normandy* horses so much used for draft purposes in

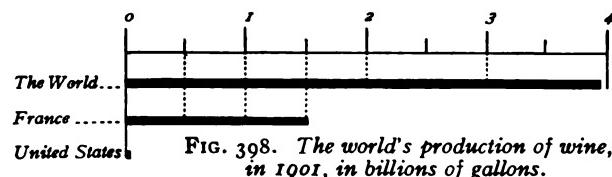
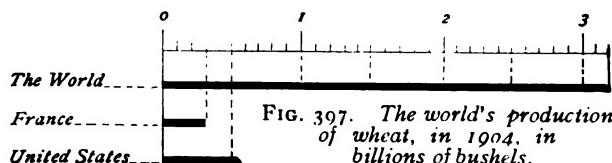


FIG. 399. Making *Roquefort* cheese in limestone caves.

our own country. In the warmer regions of the south, especially between the mouth of the Loire and the Pyrenees, mules are raised in great numbers.

Minerals. The principal minerals of France are coal, iron, and salt. These are not widely

scattered, however, and for this reason the industries which depend upon them are centered about a few regions only. The principal coal and iron deposits are along the Belgian frontier and in the eastern highlands. Near these regions are found the great manufacturing towns of *Lyons*, *St. Etienne*, and *Lille*. Salt is found along the western coast from the Garonne to the Loire and about Nancy.

Fishing. France ranks high as a fishing country, and consumes a great quantity of the product. The fish caught are largely cod from the Atlantic, and from about certain small islands near Newfoundland, owned by France, and which serve as the base for the fisheries on the Newfoundland banks. Oysters are found in the Bay of Biscay and in the English Channel. Sardines are found along the northern and western coasts, and are canned and sent to all parts of the world.

Manufacturing. France ranks fourth among the manufacturing countries of the world; it is surpassed by the United States, the United Kingdom, and Germany, all three of which have richer deposits of coal and iron and better opportunities for carrying on ocean commerce. France excels, however, in the quality of its products. The manufacturing is scattered, owing to the general lack of fuel, and the largest centers are near the coal fields. Iron and steel working are the principal occupations at *St. Etienne*, near the eastern coal field. *Marseilles* and *Bordeaux* are also steel cities, but their product is made largely from iron imported from Spain, where rich iron ore is found in great quantities. *Paris* is a manufacturing center for jewelry, gloves, and other goods of a similar nature.



FIG. 400. *Lyons, the leading silk market of the world.*

Textiles. In textile manufacturing France leads the world. More than one million people are employed in this industry. Silks are woven in great quantities about *St. Etienne* and in the vicinity of *Lyons*, which is the greatest silk market of the world. The

proximity of mulberry fields and coal deposits, and the fact that the water from the mountain streams is especially good for dyeing, make the success of the industry very great. Linens are made near the coal fields of the Belgian frontier, and especially at *Lille*. At *Rouen*, cotton goods

are manufactured; the power is largely furnished by coal imported from England.

Domestic Trade. Owing to the fine system of railways and interior waterways, and to the several available harbors, France is the fourth country in the world in commercial importance, and has about one-twelfth of the world's trade.

The direction of the slopes and the rivers leads most of the interior commercial routes toward *Paris*, which is the largest city on the continent of Europe, yet only a little over one-half as large as London.

Foreign Trade. Nearly one-half of the trade of France is with the United Kingdom, so close at hand, while one-eighth is with the United States. The largest exports are textiles, small goods of artistic value, and wine. Its largest imports are food products and raw materials for manufacturing, including wool and coal from the United Kingdom, lumber from Scandinavia, and cotton, petroleum, meats, and cereals from the United States. *Le Havre*, the great cotton port, receives this commodity direct from the southern ports of the United States. About one-tenth of the



FIG. 401. A view of Paris, looking toward Notre Dame Cathedral and City Islands.

imports are received from our country, while only 6 per cent of the exports are sent to the United States.

It is interesting to note why Paris, the capital of France, has not grown so rapidly as London, which is only about two hundred miles away. Paris is beautifully situated in the fertile valley of the Seine; it has excellent waterways connecting it with the great manufacturing centers of France. But it is seriously handicapped by its inland position. Were the Seine as broad and deep as the Thames, Paris would doubtless have become the distributing center for French manufactures, which are now sent to a half dozen lesser ports to be shipped to different parts of the world. Another reason why we should expect Paris to be a smaller city than London is the lack of coal and iron in the country to develop manufacturing to the extent to which it has developed in England. A third reason is that the colonies of France, when compared with those of England, are unimportant, and the amount of trade which they bring is limited when compared with the volume of commerce which the English colonies bring to the capital of the British Empire.

People. In the large cities of France, and especially in Paris, the people are very

polished and fond of excitement. The latter characteristic is expressed in their manner of speech, in their movements, and in their fondness for political struggles. In the rural communities, on the contrary, the people are more slow of speech and action, more satisfied with the monotony of their daily life, and less easily excited.

The rural life of one province is often different from that of another, because the people are of different ancestry and hence of various dispositions. In many of the provinces women share the hard outdoor labor with the men, and in some cases perform the larger part of the farm work. They labor in the fields during the day and care for the household, and in some cases the dairy, morning and night.

Scenery. France is especially noted for the beauty of its cities. Paris is one of the most beautiful and interesting cities in the world (see Fig. 403), and is annually visited by many tourists. Because of its mag-

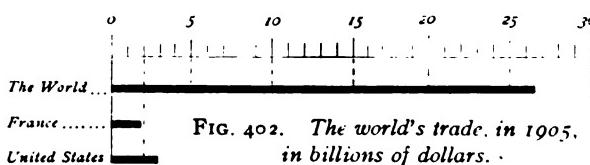


FIG. 402. The world's trade, in 1905, in billions of dollars.

nificent art galleries, the most noted of which is the *Louvre* in an old and historic palace, and because the French are extremely artistic, Paris has become the art center of the world. Students of art come to it from all parts of the world to study under famous artists.

The scenic beauty of France that is of interest to the traveler and visitor is found



FIG. 403. The beautiful boulevards of Paris from the Arc de Triomphe.

along the coast of the Riviera; in the hills of Brittany, noted for their picturesque peasant life; in the cave region of the Causses, and in the Auvergnes.

MONACO AND ANDORRA

Position and People. In southeastern France, just east of Nice, is the independent principality of *Monaco*. It is in the most favored portion of the Riviera, and is visited each year by many tourists. Its revenues are derived from the gambling tables of Monte Carlo.

High up among the Pyrenees lies the little republic of *Andorra*. It is inhabited by a sturdy race of peasants who have maintained their independence for centuries.

Questions and Exercises

(1) On an outline map of the world color France and its chief possessions in blue.

(2) What is the importance of a mountain boundary such as the Pyrenees? (3) In what way are the natural boundaries of the United Kingdom superior to those of France? (4) What advantage has this superiority given the United Kingdom over France? (5) What river forms a great highway into Switzerland?

(6) Draw a sketch map of France showing the Loire, the Seine, the Garonne, and the Rhone rivers. (7) Draw the canal connecting the Garonne with the Mediterranean. (8) What can you say of the advantages France has for internal trade?

(9) Why does the Riviera have little rain while the north slope of the Pyrenees has heavy rainfall? (10) Why should northeastern France have greater extremes of climate than the Rhone Valley? (11) Why should France be more of an agricultural country than a manufacturing country? (12) Where are her prairies, and what is raised on them? (13) What part of the country has furnished sailors, and why?

(14) Make a list of the manufacturing towns of France; opposite each write the names of

the articles manufactured, and in a third column the reasons for this.

(15) What are the particular advantages in the location of Rouen, Paris, Orleans, Lyons, and Brest? (16) Why is there no town at the mouth of the Rhone? What is the chief importance of Calais and Boulogne? What are some of the things in Paris that make the city beautiful?

LIV. THE IBERIAN PENINSULA

SPAIN AND PORTUGAL

Size and Boundaries. The Iberian Peninsula, which has about the area of Texas, contains the two nations, *Spain* and *Portugal*. It is nearly surrounded by the sea, and is separated on the north from France by the high barrier of the Pyrenees. These mountains have few passes, so that land communication with France is difficult.

Owing to the regular shore line there are few good harbors. Portugal, which has the best harbors, is a maritime nation of some importance.

Possessions. Portugal has large possessions in Africa, including *Angola* and *Portuguese East Africa*; it holds some islands in the Pacific, and the *Azores*, the *Cape Verde*, and the *Madeira* islands in the Atlantic. Spain possesses the *Baleares Islands*, the *Canaries*, a few islands off the coast of Africa, and a narrow strip of the Saharan coast. Until 1898 Spain owned *Cuba*, *Porto Rico*, and the *Philippines*, all of which were lost during the Spanish-American war.

Surface and Drainage. Three-fourths of the area of the Iberian Peninsula is a great plateau averaging about twenty-five hundred



FIG. 404. Looking over the housetops in the poorer districts of Paris.



FIG. 405. *The mode of street travel in the Madeira Islands.*

feet in height, that is, higher than the Cumberland Plateau in the southern Appalachians. This plateau is broken by numerous ridges of nearly parallel mountains known as sierras. The most southern range is known as the *Sierra Nevada* and is separated from the rest of the plateau by the broad valley of the Guadalquivir River.

Owing to the form of the land and to the youthful character of the streams, the rivers are interrupted by numerous rapids and shallows and are not navigable for any great distance. The *Guadalquivir* is the most important exception; vessels can ascend it to *Seville*. (See Fig. 406.)

Climate. The climate of the Iberian Peninsula is characterized by very marked differences between summer and winter. In winter the region lies in the path of the westerly winds, but in summer it is occupied partly by the horse latitudes and partly by the northeast trade winds. Therefore the winters are moist and the summers extremely dry.

As the westerly winds rise to reach the interior plateau they become cooler and lose a large part of their moisture, so that the western coast receives a fairly abundant rainfall in winter.

The barrier of the Pyrenees protects the peninsula from the cold continental winds of northern Europe. In fact the climate of the peninsula is more like that of Africa than that of Europe. Hence it is often said that Africa extends to the Pyrenees.

Owing to the dryness of the summer climate, agriculture can be carried on in most places only by means of irrigation. This has been practiced for centuries, however, and large areas have been changed from deserts into fertile garden spots.

Products of the Soil. About one-half of the people of Spain and Portugal are engaged in agriculture, which is most profitable in the more rainy region of the northwest and along the coasts where irrigation is practiced. The

interior is so dry that even grass is scanty, and grazing is the leading industry there. Sheep-grazing is of especial importance; the number of sheep is greater in proportion to the population than in any other country of Europe. In the

northwest wheat and barley are grown, and cattle are raised, principally for local use.

In the irrigated lands fruits, sugar cane, olives, cork oak, and the vine are grown in abundance. Wine is the leading product.



FIG. 406. *A general view of Seville.*



FIG. 407. *The Escorial near Madrid, one of the Spanish royal palaces.*

This is particularly true in the valleys of Portugal.

Minerals. The mineral products of the Iberian Peninsula are extremely valuable, especially in the northern and southern mountains. The iron of the north is very rich and pure and is extensively worked. Coal is generally distributed, but is little worked. The Iberian Peninsula produces more quicksilver than any other country, and ranks next to the United States and Mexico in copper production. It also contains rich deposits of lead and silver. Owing to the lack of good transportation and to the backwardness of the people, however, the mineral resources have not been developed as they would have been in a more progressive country.



FIG. 408. The large public square, Lisbon.

Manufactures. Manufacturing in Spain and Portugal is not important and the products do not supply the home demand. In this respect these countries form a striking contrast to the United States and the United Kingdom, each of which has developed great manufacturing districts near its coal and iron mines.

Spain and Portugal, with their regular coast line, have few good harbors. They have no great interior waterways and few railroads. This lack has prevented the development of iron and steel manufactures, and the importation of raw material for the manufacture of textiles.



FIG. 410. Lisbon harbor.

Iron and machinery are made in small quantities for home use in the north, and textiles are produced at *Barcelona*, *Lisbon*, and *Oporto*.

Madrid, the capital of Spain, manufactures gold and silver articles, glass, and china. Its chief importance is due, however, to its being the capital and the residence of the king and his court. (See Fig. 407.)

Trade. Owning to the lack of railroads and navigable rivers the internal commerce of Spain and Portugal is small. Wine forms one-third of the exports and is sent principally to France and the United States. Oranges, lemons, olives, and cork are also important exports. The greatest trade of Spain and Portugal is with the United Kingdom and France. A large part of the latter is by water, owing to the few available passes over the Pyrenees. The chief imports are cotton from the United States, wheat from Russia, timber from Sweden, and woolen goods from France.

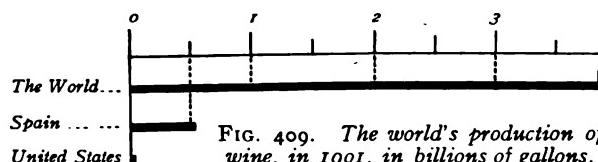


FIG. 409. The world's production of wine, in 1901, in billions of gallons.

Barcelona, the chief port of Spain, is the most enterprising city, though *Valencia*, which exports silks and oranges, and

Malaga, which exports grapes and wines, are also important. *Oporto* is the chief outlet for the foreign trade of Portugal, and gives its name to port wine, which is an important article of export.



FIG. 411. *The rock of Gibraltar, from the lowland peninsula connecting it with Spain.*

People. Owing principally to the geographic position of Portugal, the people have always been active in maritime affairs, carrying on commerce with the distant parts of the world. The Spaniards, on the other hand, were not content with trade, but endeavored to subjugate all the new countries possible, so that they could own vast riches of gold and silver. Spain was at one time a great colonizing nation, but through mismanagement the colonies have gradually been lost.

The Spaniards, like most people who live in subtropical areas, are impetuous and fond of amusement and excitement. They have many holidays and feast days, when all work stops and every one devotes himself strictly to amusements. The people of the northern provinces are more thrifty and differ strikingly from their countrymen in the south.

GIBRALTAR

Position. On the very southern point of Spain where it approaches nearest to Africa is the small peninsula known as *Gibraltar*. This is heavily fortified and belongs to the United Kingdom. As the Strait of Gibraltar is only eight miles wide, the United Kingdom really controls the entrance to the

Mediterranean through this fortress, its guns commanding nearly the whole strait. (See Fig. 411.)

Questions and Exercises

(1) Find out how the area of Spain and Portugal compares with the state in which you live. (2) Through what part of Spain does the Greenwich meridian pass? (3) How much of Spain lies in east longitude? (4) Make a list of the chief rivers of the Iberian Peninsula and opposite each write the name of the body of water into which it empties. Mark with a star those rivers which are forming deltas. (5) On which coast are the delta-forming rivers most frequent? Why? (6) Where do you find a fiorded coast line? (7) What good harbors are on these fiords? (8) Why is there no town at the

mouth of the Guadalquivir River? (9) What does the word *sierra* mean? To what mountains in North America is it applied?

(10) Tell how the climate of Spain is affected by its latitude; by its surface. (11) In what way is the surface of this peninsula like that of Africa? (12) Why should the west coast have more rain than the east coast? (13) Why do the winds blow from the sea toward the land in summer?

(14) What are the industries of the west and northwest of the peninsula? Of the interior? (15) In what way are the industries influenced by the climate? (16) Where are oranges, grapes, and cork oak grown?

(17) What hinders the internal commerce of Spain? (18) What great continent suffers from the same drawback? (19) Compare France and Spain in this respect. (20) On an outline map



FIG. 412. *The Alhambra, one of the famous old castles of Spain.*

draw the most important rivers. (21) Locate the chief ports and write near them their leading exports. Draw arrows to show where these are sent. (22) On the margin of the map write the names of the chief possessions of Spain and Portugal. (23) Locate the chief inland towns. (24) Give the chief reasons for the location of Seville.

LV. BELGIUM, THE NETHERLANDS, AND DENMARK

Position and Coast Line. *Belgium, the Netherlands, and Denmark* are each small but important nations bordering on the Atlantic. Their combined area is a little larger than that of Oklahoma. Owing to their several excellent harbors and the position of the



FIG. 414. *Along a canal, Amsterdam. Much of the city's transportation is by water.*

to which is controlled by the Netherlands, as the Scheldt flows through that country.

The Netherlands, on the other hand, has two excellent harbors, *Rotterdam* and *Amsterdam*, of which the former is the more important. Amsterdam, however, is connected with the Atlantic by a ship canal, so that its position on the *Zuid-Zee* is to a certain extent made up for by this direct connection with the great ocean. (See Figs. 376 and 414.)

Denmark is made up of many large islands and a peninsula, so that it has but little land



FIG. 413. *Antwerp, the great distributing point of Belgium.*

Netherlands at the mouth of the great Rhine waterway, which is an exceedingly valuable commercial route for Germany, they are important countries commercially.

Belgium has about forty miles of unbroken coast, with no harbor except the small one of *Ostend*, which is connected by steamship lines with *Dover*, England. The principal port of Belgium is the river port of *Antwerp*, access

boundary. (See Fig. 422.) It is not very important commercially because there is not enough land to furnish a great quantity of products for oceanic commerce.

Surface. These three countries are all low and the coast is largely sand dunes, which form good watering places, especially in Belgium. Almost all of the coastal portion of the Netherlands is below the level of the sea,

and the water is kept from advancing upon the land only by high dikes which are built as a protection against the waves. Thirty-eight per cent of this country would be overflowed but for the dikes. (See Fig. 415.) In northwestern Belgium there is a great region known as the *polders*, which has been reclaimed from the sea and is now used for pasturage.

In the Netherlands the gentle slopes are occasionally broken by glacial deposits which form the only hills in the region. Denmark is very flat and sandy and contains many marshes and lakes. In the peninsula of *Jutland* many of the lakes have become peat bogs.

Drainage. The rivers of the Netherlands and Belgium rise farther inland and flow through these countries to the sea. In the

Netherlands the land is so low and flat and the divides are so inconspicuous that a vast network of canals has been built to connect the rivers. As a result the country abounds in waterways. The products of the farms are brought to market by means of the canals, and are sold directly from the boats. In winter, when all the canals are frozen, the people travel to market on skates. As the rivers are navigable and as their valleys furnish the natural highways into the interior, the Netherlands trans-ships a large amount of goods from Germany to Atlantic ports.

Foreign Possessions. The foreign possessions of the Netherlands are small but very

important, because they lie in the tropics and furnish tropical products of great value to the people of northern Europe. They include *Java* and other islands in the East Indies, and *Dutch Guiana* in South America. Denmark owns three small islands in the West Indies and the large islands of *Greenland* and *Iceland*; the latter is valuable because of its fisheries. Belgium controls the *Congo Independent State*, and hence has important trade in goods from tropical central Africa.

Climate. Belgium, the Netherlands, and Denmark all lie in the belt of the westerly winds throughout the year. Hence the climate is even and damp, though increasing in intensity to the northward. Owing to the nearness of the sea, the winds bring a abundant



FIG. 415. In the dike-protected districts of the Netherlands.

moisture to the region. As a result more than one-half of the days in Belgium are cloudy, and it rains in the Netherlands on an average of 204 days in the year.

The winds are not impeded by any irregularities of the surface and can therefore be depended upon to blow with sufficient intensity and regularity to turn windmills. This accounts for their general use.

In Denmark the climate is very much like that of eastern Scotland, but the winters are not sufficiently severe to close the harbors with ice for any length of time, though drifting ice is common for many months. The dampness here favors the formation of peat.

Products of the Soil. Owing to the fertile soil and moist, even climate, Denmark and the Netherlands are primarily agricultural countries. Denmark, in its more rugged districts, is devoted to grazing, and has more cattle in proportion to its size than any other country of Europe.

The dairying is conducted very carefully, and Danish butter is so good that it is carried to all parts of the world. The chief crops of Denmark are oats, hay, and roots.

In Belgium, cereals, flax, hemp, and sugar beets form the principal soil products. Sheep are raised in the drier southeastern portion. The country is also noted for its poultry and its horses.

In the Netherlands the best soil is near the sea and in the southern part of the country. Grazing and the raising of sugar beets, rye, and vegetables are important. The Netherlands is also famous for butter and cheese.

Minerals. Few of the minerals are important. The Netherlands produces peat and pottery clay; the most important deposit of this clay is found about *Delft*, which gives its name to a certain kind of fine china. Coal and iron are found in Belgium in the hilly country; these deposits are a continuation of those found in France.

Fishing. Fishing is important in the Netherlands, especially that carried on in the North Sea



FIG. 416. *Peddling milk in dog-carts in Belgium. The inspector is making a note.*

and about Iceland. The principal fish is the herring, which is packed for export. Oysters are also found in abundance.

Manufacturing. In the Netherlands and in Denmark there is little coal and iron, and manufacturing is therefore relatively unimportant. Few

goods are produced except for local use. Belgium, however, is a very important manufacturing country. More than one million of its people are engaged in manufacturing, the preëminence of which is, of course, due to the mineral wealth of coal and iron.

Brussels, the largest town, is noted for its lace and carpets. (See Fig. 417.) *Liège*, another manufacturing city, is known especially for its iron and steel goods, firearms, machinery, and tools. Woolen and cotton manufacturing are also important. *Ghent* is especially noted for its linens.

Trade. The trade of Belgium, the Netherlands, and Denmark is very great. Canals and railroads cover Belgium, and the Meuse River is navigable to the German boundary; therefore the interior trade is easily carried on.

The trade of Belgium is almost entirely concentrated at *Antwerp*, which receives and again exports the larger part of the world's ivory. Belgium is a forwarding country for Germany and for goods from the United States destined for central



FIG. 417. *A street in Brussels.*

Europe. The chief exports are iron and steel, coal, guns, cereals, and glassware; the imports are cereals, wool, lumber, and petroleum. Grain and petroleum are imported from the United States, but the exports to our country are few and unimportant.

In the Netherlands the chief trade is in exports to its colonies and in goods brought from these colonies and again exported. These include coffee, spices, gums, indigo, dyewoods, diamonds, leaf tobacco, and other goods of a similar nature. Butter, meat, and cheese are

are the largest imports; butter, eggs, and meat are almost the only exports of importance.

People. The people of Belgium, the Netherlands, and Denmark are all very interesting because of their general thrift and industry, as well as for their customs.

The Danes have always been successful as colonizers. They have a high standard of education. The greater proportion of the population are rural people, living simple and quiet lives, devoted to their homes and their country.

The people of the Netherlands are of many

stocks, but they are united by a common written language, called *Dutch*, which is the common spoken language among the cultured classes. In many of the rural districts dialects which have been inherited for generations are spoken. The people as a rule dress in full, loose clothes and wear wooden shoes; this may be considered the national costume. The Dutch have been important colonizers; they



FIG. 418 Copenhagen, the great distributing center of Denmark.

sent to England and Germany; cotton goods are sent to the colonies. From the United States the Netherlands secures cereals, tobacco, and meat products, which make about one-eighth of the imports of the country.

In Denmark, Copenhagen is the great distributing port for the Baltic countries, and the larger part of its trade is with them. Coal, textiles, food products, and machinery

were among the first to establish their settlements in our own country. Many of the local names about New York City and in the Hudson River Valley are witnesses to the former occupation by the Dutch.

The Belgians are more advanced in the arts and sciences than either the

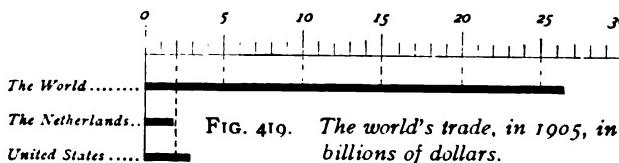


FIG. 419

Danes or the Dutch. They show the influence of their neighbors, however, in the persistence



FIG. 420. *Antwerp, the great ivory market of the world.*

of two national languages, *French* in the southern provinces, and *Flemish*, which is closely akin to Dutch, in the provinces bordering the Netherlands.

Scenery. The color conditions due to the climate and the vegetation make these countries, and especially the Netherlands, a favorite resort for artists. The quaint rural people with their characteristic costumes, their large flowing clothes and wooden shoes, are also a great attraction.

Belgium, being a buffer state between several great nations, is of much interest historically. It has been the scene of many great battles, some of which, like that of Waterloo, where Napoleon was defeated in 1815, are famous the world over.

Questions and Exercises

(1) What does a study of the map tell you of the disadvantages to commerce of the coast line of Belgium? (2) What is its chief ocean port, and what are its principal advantages and disadvantages? (3) How has the inland city of Amsterdam been made an ocean port? (4) Examine the position of Belgium between France and England on one side and central Europe on the other. What natural advantages has it for doing a transit trade? (5) Why has it been a great battlefield in modern times?

(6) What disadvantage does Belgium suffer with regard to her two rivers? (7) Make a chart of the products of Belgium, the Netherlands, and Denmark according to the following directions: In one column write the names of the products; in another the countries where they are found; in a third some facts you have

learned about the importance of these products; in a fourth the cities engaged in manufacturing or exporting these products.

(8) Compare Copenhagen and Gibraltar in position; in importance. (9) Why is the Baltic Sea not so important as the Mediterranean?

LVI. NORWAY AND SWEDEN

Size and Extent. The peninsula of Scandinavia includes the two countries, *Norway* and *Sweden*. Norway is nearly as large as New Mexico, and Sweden is a little larger than California.

The peninsula extends far beyond the Arctic Circle and over more degrees of latitude than any other division of Europe except Russia. It is swept by the westerly winds, which bring to it the warmth and the moisture they have taken up in passing over the North Atlantic Drift. For this reason it has a mild, damp climate on the western side, where the average temperature is much higher than is usually found in a country so far from the equator. (See Fig. 74.)

Coast Line. The coast line of Norway is very irregular; it abounds in magnificent fiords, affording fine harbors far famed for their scenery. (See Figs. 55 and 421.) Off the coast are a great number of islands, forming a kind of barrier which protect coasting vessels in their voyages along the inside channel. These islands are surrounded by



FIG. 421. *A Norwegian fiord.*

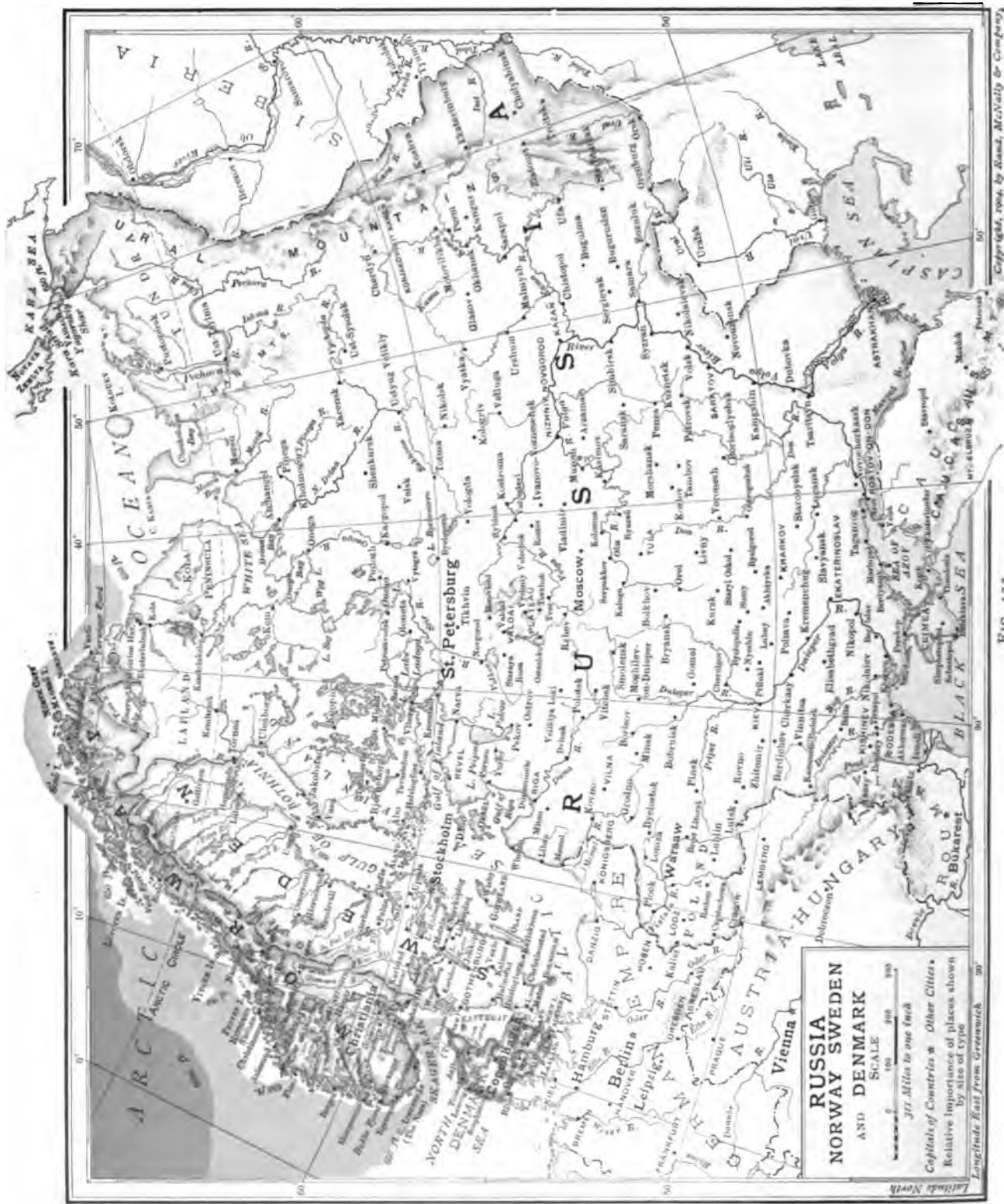


FIG. 422.

shoals which abound in fish. Because of these favoring conditions the inhabitants of Norway have long been a seafaring people.

The eastern coast contains many harbors, but the climate here is more severe, and many of the harbors are ice-locked for several months in the year, some of them even for six months.

Surface and Drainage.

Norway occupies the short, steep, western slope of the Kjölen Mountains, and with the exception of Spain it is the most distinctly mountainous country in Europe. Sweden lies to the east, and is for the most part a level plain which has been glaciated and is dotted with numerous lakes. The larger lakes are connected with each other and with the sea by canals, so that transportation is made easy.

More than two-fifths of Sweden and one-fourth of Norway is covered by forests. The highest mountains in the north and northwest of Norway abound in great glaciers, which, with the fiords and waterfalls, give the country much strikingly beautiful scenery.

Climate. There is a great difference between the climate of Norway and Sweden, because Sweden is shut off from the mild westerly winds of the Atlantic by the north and south highland. The *Lofoten Islands*

have an average winter temperature no lower than that of New York City, while the average temperature in eastern Sweden in winter is twenty degrees colder. The higher valleys of Norway have a severe and uncomfortable

climate, and in consequence are little occupied, but the climate of the lower valleys and the seacoast is tempered by the ocean breezes.

The warm winds of the Atlantic give up much of their moisture on the western coast, where, in places, the rainfall is as great as seventy-nine inches a year; it decreases to the east, in some places amounting to only thirteen inches. There is

a great abundance of snow in Sweden, and hence the use of a peculiar kind of snowshoes known as *skis* is very common. Sweden has a summer temperature, however, that is favorable for hardy grains. (See Figs. 82 and 84.)

Products of the Soil. Except in eastern Sweden, the amount of land in the peninsula suitable for farming is very limited, and as a result only a small portion of the people

are engaged in agriculture. The vast forests make Norway and Sweden the most important timber-producing countries in Europe. On the higher slopes, which are not timbered, the abundance of moisture brings forth an excellent supply of grass, which furnishes food for large numbers of cattle and sheep.

Mining. In both Norway and Sweden mining products are important, but owing to the great purity of Swedish iron, mining is better developed in that country. Cop-

per, silver, and zinc are also obtained in Sweden, but there is very little coal. Silver, gold, and copper are mined in Norway.

Fishing. Owing to the poor agricultural opportunities in Norway, the people naturally



FIG. 423. A mountain on the coast of Norway, which has been much worn away by the waves.



FIG. 424. Norwegian peasant women.

turned to the sea for their food. Therefore the fishing industry, which is favored by the splendid harbors and the proximity of the Atlantic fishing grounds, is the leading industry in Norway. The principal center is about the Lofoten Islands, where sometimes more than 40,000 men are engaged. Cod, herring, anchovies, mackerel, and salmon are the most important fish.

Manufacturing. Owing largely to the abundance of water power furnished by the short streams from the mountains, manufacturing is increasing rapidly. Timber products, including wood pulp and matches, are the chief manufactures. Swedish matches are exported to all parts of the world. The development of fishing makes fish-curing and shipbuilding noteworthy occupations in Norway. The manufacture of woolen and cotton goods is increasing.

Trade. Sweden is the largest lumber and timber exporting country in the world, and these products form about one-half of the total exports. They are sent principally to the other countries of Europe where timber is scarce. Owing to the excellent harbor facilities of Norway, this country has long been important for its oceanic commerce.

In Sweden the numerous railroads and canals make transportation of goods from the interior cheap and easy. The chief imports are breadstuffs and woolen manufactures. The trade of the countries with the United States is small and unimportant.



FIG. 425. *The city of Stockholm, Sweden.*

Stockholm, which is built on a number of islands connected by bridges, is the chief importing city, but is excelled in exports by *Gothenburg*. Gothenburg, from its position near the North Sea, carries on an active commerce with the countries of continental Europe.

Other cities of commercial importance are *Christiania*, built at the end of a long and fine harbor; *Bergen*, which is the center of the fish trade, and *Trondhjem*, which is the third town in size. All the large towns of both countries are near the sea, and in Norway the larger number of people live close to the shore.

People. The people of Norway and Sweden were for very nearly a century united under one government. In October, 1905, however,

Norway withdrew from the union and formed a separate kingdom with a king at the head of the government.

The people are exceedingly industrious, and in spite of the many adverse conditions they gain a livelihood by their simple rural occupations. The educated men, however, have always been leaders in science and literature, and some of the Norse legends and traditions of past ages as recorded by the early writers,

rank among the great and enduring masterpieces in literature.

Scenery. Norway is visited each summer by large numbers of people who are attracted by its magnificent scenery. There are many wonderful glaciers and waterfalls, and the fiords are of great interest and beauty.

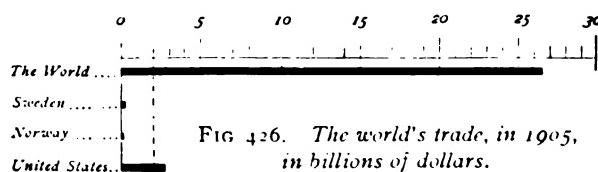


FIG. 426. *The world's trade, in 1905, in billions of dollars.*

The more northern towns like *Hammerfest* and *Tromsö* are much visited by people who want to see the *midnight sun*. (See Fig. 428.) These towns are so far north that during a part of the summer the sun can be seen both night and day. Of course in winter there is an equal length of time when the sun does not rise at all.

Questions and Exercises

(1) Draw a sketch map of Norway and Sweden. Draw the parallels of 55 and 70 degrees north latitude. Through how many degrees do these countries extend? (2) What difference in temperature between the south and north might you expect? Find out from the temperature map of the world whether this difference exists. Reason for this? (3) What portion of North America has a similar range of temperature? For what reason? (4) What is the difference in temperature between the western and eastern coasts? In rainfall? (5) What causes this difference? (6) Color the map drawn in Exercise 1 in shades to show the rainfall of Norway and Sweden. (7) Draw the January isotherm of 30° with one color, the July isotherm of 60° with another. What can you say of the western slope of Norway as compared with the eastern slope of Sweden? (8) What is the character of the rivers of Norway? (9) How has the character of the coast affected the occupations of her people? Illustrate this.

(10) Draw a diagram which will explain the fact of the *midnight sun*. (11) Tell how life in Sweden in winter and summer would be different from your own.

(12) Give one reason why so many matches are made in Sweden. (13) Why should cheese



FIG. 428. *The midnight sun at Hammerfest.*

be an important food of the people? (14) Name three countries of Europe which have an extensive fishing trade. (15) What are the climatic and surface conditions which favor the growth of forests? (16) Of what use are the Swedish rivers in the lumbering industry?

(17) Compare the locations of Stockholm and Venice. (18) Consult the temperature map and find out if the harbor of Stockholm would be closed by ice during the winter. (19) On the map used above locate the chief towns.

LVII. RUSSIA

Size. Russia is the largest country of Europe. It occupies more than one-half the continent and is about two-thirds the size of the United States, not including Alaska and the other detached dependencies. It extends far beyond the Arctic Circle, and is really the western part of the great plain which occupies Siberia. The Russian Empire, which includes *Siberia*, *Turkistan*, and *Caucasia*, occupies one-sixth of the land surface of the globe.

Coast Line and Boundaries. Although Russia is bordered by the ocean or large seas in the north, west, and south, it has few good harbors for the reason that a large part of its coast is ice-bound during several months of the year. As Germany controls the entrance to the Baltic, and Turkey that to the Black Sea, these seas are of little commercial value to Russia. Russia has now



FIG. 427. *Bergen, the second city of Norway, and the center of the fishing industry.*

secured an outlet to the Pacific Ocean at Vladivostok in Asia, on the sea of Japan, at the end of the long Trans-Siberian Railroad.

Russia is bordered on the northeast by the Ural Mountains, which attain mountain dignity only in places. At the point where the great Trans-Siberian Railroad, which connects St. Petersburg and Vladivostok, crosses the Urals, no one would know from the outlook that a mountain range existed.

Surface. The only elevation of any note in the great plain of Russia is the Valdai Plateau, which rises to a height of 1,100 feet and acts as the center from which the drainage of the region radiates. Many long rivers flow down the gentle slopes toward the edge of the country, and are therefore of great commercial importance when not ice-bound. (See Fig. 369.) The largest river, the *Volga*, is frozen for three months in the year. Many lakes dot the surface of northwestern Russia, especially in Finland. *Lake Ladoga*, which is nearly as large as Lake Ontario, is the largest lake of Europe.

In southeastern Russia there is a large area which is below sea-level. This region borders the Caspian Sea, whose surface is eighty-six feet below the Mediterranean. Many of the lakes of this section therefore have no outlet and consequently are salt or brackish.

Climate. Russia lies in the eastern section of Europe, far from the tempering influence of any ocean, and is therefore characterized by extremely cold winters and short, hot summers.

The growing season is short and follows quickly after a late spring. Approximately one-half the area has a rainfall of less than twenty inches a year, but as this comes largely during the growing season, agriculture can be carried on successfully in the central and southern portions.

Products of the Soil. In the north is the *tundra* area, mainly of use for pasturing reindeer. Here the *Lapps* and *Samoyedes* live a nomadic life, depending largely upon the chase for their support. (See Fig. 430.)

Extending south as far as a line running southeast from St. Petersburg is the great forest region, composed largely of evergreen trees from which resin and timber are secured. This is also the great fur-producing area of the country.

Central Russia is an agricultural and industrial region, and the richest part of the country. This agricul-



FIG. 429. Looking down the broad valley of the river Volga.



FIG. 430. A Lapland camp.

tural area includes the famous *black earth* region, an area of land of unsurpassed fertility which extends south to the parallel of 50 degrees north latitude. The rich, dark soil of this treeless region is well adapted to the

growth of cereals, especially wheat and barley, which require an abundance of sunshine. Owing, however, to the general ignorance of the people and to the use of poor machinery, agriculture does not thrive as it should. At present there is an increased use of modern agricultural tools imported from the United States, and agriculture is improving.

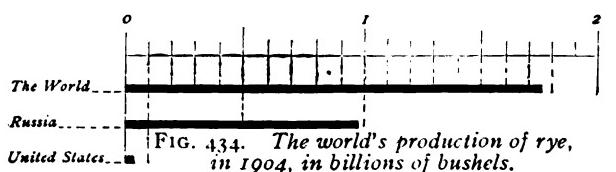
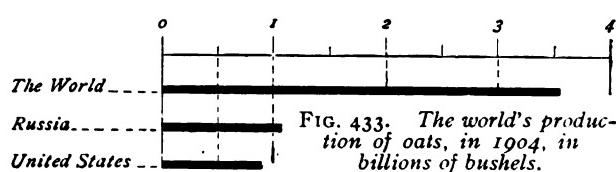
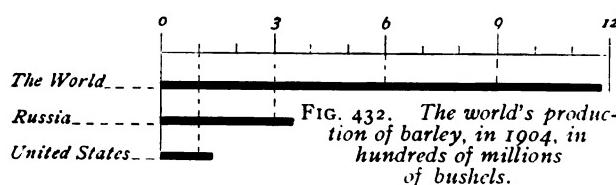
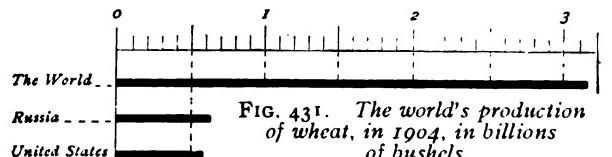
South and southeast are the arid *steppes*, great plains covered with grass, but too dry for agriculture. Here is a nomadic people who raise great numbers of cattle, horses, and camels.

Russia now leads the United States in production of wheat, raises more flax and hemp than any other country of the world, and produces nearly one-half of the oats grown in Europe. It excels all European countries in production of barley, surpasses all other countries in rye, and ranks fourth among sugar producing countries.

The rye, however, is used largely at home, as the people live chiefly upon black bread.

Russia also raises one-half of the horses of Europe, more cattle and sheep than any other country in Europe, and is second to Germany in hog raising.

Mineral Products. Russia has an abundance of coal and iron, worked chiefly in southern Russia and Poland, and large deposits of gold. The most valuable mineral product is platinum, which comes from the eastern slope of the Urals. In fact, this region produces the larger part of all the platinum used in the world.



Manufacturing. Russia at the present time is producing nearly enough manufactured products for its own use. But owing to the backward condition of the country and to the fact that the mineral deposits are not so well developed as in the United States, the United Kingdom, and Germany, it has no very large manufacturing centers. Most of the manufacturing is done in small shops or in the

homes of the people. The chief products are textiles, leather goods, wood and metal goods, and pottery. Cotton manufacturing is especially important. Russia is surpassed only by the United States and the United Kingdom in the manufacturing of cotton. The raw material is largely imported from the United States.

Moscow, with coal and timber near at hand, leads in manufactures and is the chief railroad center. Its principal industries are wool and silk

weaving. (See Fig. 435.) *Warsaw* on the Vistula has steam navigation on that river and is the second inland city in industry and trade. Textiles are produced at *St. Petersburg* and in *Poland*. *Odessa* has important flour mills, sugar refineries, and breweries. (See Fig. 437.)

Travel. There are few railroads in Russia, and the larger portion of the trade of the country is carried on by water. In winter when the rivers and canals are frozen most of the transportation is by means of sledges. The building of the Trans-Siberian Railroad has been of great importance to Russia, for



FIG. 435. Moscow, showing the Kremlin on the left.

along its route agriculture and manufacturing have been stimulated and will undoubtedly grow in value as the years go on. It is now possible to go from St. Petersburg, the capital of the empire, to the Pacific coast in a little over two weeks, with comfort and ease. The road is, however, poorly built and the trains cannot attain the speed common in transcontinental traveling in North America.

Commerce. The chief exports of Russia are wheat and flour, flax, hemp, timber, and dairy products. Russia sends large quantities of wheat to the United Kingdom, and imports machinery from that country and Germany. The exports to the United States are chiefly leather, flax, and flax-seed.

The Black Sea ports, of which Odessa is the most important, are mainly devoted to the transportation of agricultural products sent to Asia and southern Europe. St. Petersburg, owing to its position, is the most important trade center in the north; it exports grain and lumber. Riga exports rye, oats, and lumber. The trade of Astrakhan is

principally in sturgeon and other fish secured from the Volga.

Fairs. Before the development of canals and railways in recent years, the largest part of the trade of Russia was carried on at great annual fairs which were held at *Nizhniy Novgorod* and *Kharkov*. Although these fairs have declined somewhat in importance, they are still the scenes of active trading in goods from all parts of the world. People attend by thousands from all parts of the empire and many million dollars' worth of trade results each year.

People. The people of Russia differ in many ways from those of any other nation of Europe. They belong for the most part to a somewhat different branch of the white race, though they include many Swedes, Finns, and Jews among their numbers.

Owing to the poor development of education and to the form of government, the Russians as a whole are not progressive. The Czar is the head of the government and allows the people but little voice in the government. The people are also



FIG. 436. St. Petersburg, the capital of Russia.



FIG. 437. The port of Odessa.

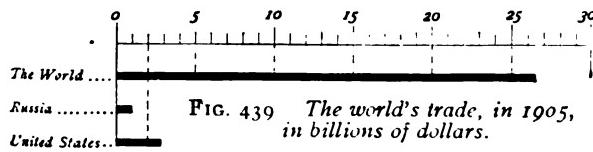
very heavily taxed for the maintenance of the government and the large standing army, and therefore have little accumulated wealth.

Throughout a large part of Russia the people own their lands in groups, each member of a group having a certain amount of field and pasture land, so that he can gain a livelihood for his family. He cannot give up the land and it is therefore difficult for him to change his occupation or his place of abode.

In spite of the general poverty of the people Russia is very strong, and is becoming each year a more important power among the great nations of the world. This is due more to the action of the government, however, than to the inventiveness and initiative of the people, who still remain, in many parts of the country, almost hopelessly ignorant, backward, and unprogressive.

Questions and Exercises

(1) Make a list of the Russian ports that are icebound during a part of the year. (2) Why did Russia build the Trans-Siberian Railroad? (3) What towns does this railroad connect?



(4) Draw a diagram showing how the Valdai Plateau is the center from which the rivers of Russia flow. (5) Draw a portion of the coast at the mouth of each river of Russia and locate

the parallel which passes through Astrakhan and Archangel. (6) Why should the Don be free from ice when the Volga is blocked for three months of the year? (7) Account for the number of lakes in Finland and compare with a portion of the United States for similarity of surface and cause. (8) Why are so many lakes in the south of Russia brackish? (9) What region in the United States has brackish lakes for a similar reason?



FIG. 438. Sebastopol, one of Russia's ports on the Black Sea.

(10) On an outline map color the different vegetation regions of Russia. (11) On this map write the average rainfall of these regions and their January and July temperatures. (12) Write the chief products of the *black earth* and the *steppe* regions and underline those products which are raised in great quantities.

(13) How does Russia rank in the production of wheat? (14) Through what port does the wheat of Russia pass to the East?

(15) What are the disadvantages of the location of St. Petersburg as a capital? (16) Draw the main railroads diverging from Moscow. (17) Trace the route of the Siberian Railroad in Russia and name the towns on the road. (18) Tell how you would go from Berlin to Baku; from Moscow to Paris. (19) Why is Helsingfors a good place for an astronomical observatory? (20) Explain the difference between the January temperatures of Archangel and Reikjavik.

LVIII. THE GERMAN EMPIRE

Size and Boundaries. The German Empire, or Germany, is the most central country of Europe. It is as large as the New England States, New York, New Jersey, Pennsylvania, and Ohio. Besides the home country the empire also includes large possessions in Africa, *German New Guinea*, and certain small islands in the Pacific. (See Fig. 382.)

Only one-third of the boundary line of Germany is seacoast. This necessitates the maintenance of a large army for defensive purposes. The northern frontier is on a lowland difficult of defense but favorable for trade. The rest of the land boundary is in mountainous regions which are easily defended.

Germany may be divided into North and South Germany. The former controls the maritime trade and the latter the commerce with the neighboring countries, which is carried on along the Danube and over the Alps. The coast is largely bordered by shallow waters and therefore does not afford so many harbors as we should expect from its length and indentations. The Baltic Sea has many lagoons known as *Haff* which are used as harbors.

Hamburg, the greatest seaport on the continent of Europe and the third port in importance in the world, owes its supremacy to its location on the most southeasterly inlet on



FIG. 440. *On the water front at Hamburg.*

the North Sea, and on the lower Elbe, which, next to the Rhine, is the chief waterway of Germany. (See Fig. 440.) *Bremen*, which is nearest the Atlantic, is a close rival, but is less favorably situated because the Weser River offers less extensive water connections with the interior.

Surface. North Germany is a part of the great lowland of northern Europe, while the southern part is a highland culminating in the Alps. The northern plain, which is nowhere

over 600 feet in height, is covered with sands and clays brought by the great ice sheet, and abounds in small glacial lakes.

The southern plateau is from 1,000 to 2,000 feet in altitude. In the extreme south where it joins the Alps it becomes higher, but at no point is it 10,000 feet above the sea level. The higher lands of Germany also include the Bavarian Plateau, which is covered with glacial deposits, and the Central Highlands from the Carpathians to the Rhine.



FIG. 441. *Looking down the Upper Rhine Valley.*

Drainage. The rivers of Germany all flow to the north except the *Danube*, which is the most important commercial river of eastern Europe. The chief rivers of North Germany are the *Elbe* and the *Rhine*. (See Fig. 442.)

The Rhine is navigable to Mannheim and is connected by canals with the Rhone, the Seine, and the Danube. Canals also connect Berlin with the Elbe, and the Elbe with Kiel. The Kiel canal is of great importance to shipping because it has shortened by many

THE GERMAN EMPIRE

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FIG. 442.

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miles the trade routes between the Baltic ports and the Atlantic Ocean. Other canals follow the valleys of the rivers which are too small for navigation. (See Fig. 376.)

Climate. Germany lies entirely within the westerly wind area. Therefore the western portion has a climate which is somewhat tempered by the ocean. Toward the east the winterclimate becomes colder because the continental conditions there more than counteract the influence of the ocean. The temperature of southern Germany is no higher on the average than it is in northern Germany, because the advantage of a more southern position is offset by the increase in altitude. The low-lying protected plains of the Rhine, Moselle, Neckar, and Main have hot summers and mild winters.

The westerly winds give up their moisture as they blow over the land, so that the rainfall decreases from about forty inches in the western part of Germany to about twenty inches in the east. The headwaters of the north-flowing rivers of the east, like the Vistula, thaw out in the spring before the lower regions are free from ice, and great and damaging floods often result.

Products of the Soil. About one-half of the area of Germany is cultivated, one-fourth

is in forest, and the rest is mostly used as pasturage. (See Figs. 119 and 443.) As a result the agricultural products are very important.

Sugar beets, which are raised extensively throughout central Germany, are the largest crop, and from them Germany produces about one-fifth of all the sugar of the world.

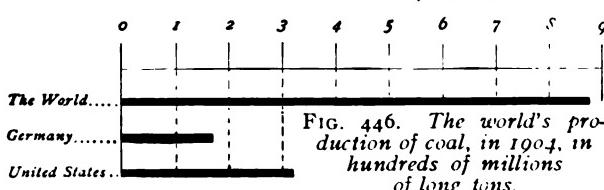
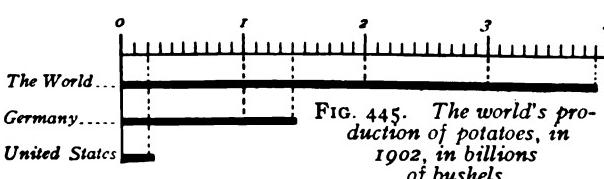
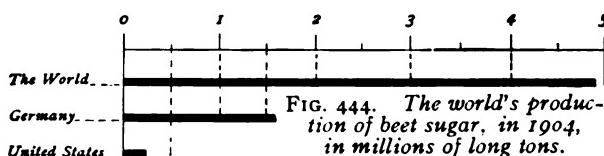
In the northern plain are vast fields of potatoes, in which crop Germany also leads the world. Owing to the poorness of the soil and to the absence of opportunity for manu-



FIG. 443. Farms and pastures in the forest region of Germany.

facturing, this region has a low density of population except in the valleys of the Oder and the Vistula. Where the soil is sufficiently fertile, cereals are grown. Rye is raised in large quantities, but is largely used at home in the making of black bread.

The best soil and the most favorable climate for agriculture are found along the Rhine, where grapes and tobacco are the chief crops. Grapes are also raised in certain favored points in the valley of the Oder, the most northerly limit of vine culture in the world. The other noteworthy crop of Germany is hops, which are raised more especially in



the higher areas of Bavaria. The larger part of this crop is used in the breweries of Munich.

In the hilly districts of central Germany are forests of beech, fir, spruce, pine, and

oak, from which are secured wood for the famous toy factories of Nuremberg.

Stock Raising. Germany is second to Russia among the European countries in the raising of cattle. The breeding of horses and cattle is carried on extensively in the damper plains of the north, while sheep are raised in the drier eastern section. Hogs are kept in large numbers on the farms in the sugar-beet area, where they live on the refuse from the sugar factories. Large numbers are also raised in the hilly district of central Germany, where they feed on the nuts in the forests.

Mining. Germany is very rich in coal and iron and is second to the United Kingdom among European countries in the production of these minerals. It also has extensive mines of silver, copper, and salt, and furnishes the larger part of the zinc of the world. Copper is found in the Erzgebirge and the Harz mountains. Bavaria furnishes the best of the lithographic stone used in engraving throughout the world.

The particular advantage of Germany in minerals is that the coal and the iron are found near together and close to navigation, especially in the valleys of the Rhine, the Elbe, and the Oder. The iron is worked only where it is near coal, and on these two depends Germany's great advance in manufacturing.

Manufacturing. For the reasons given above Germany is distinctly a manufacturing

country. It ranks next after the United States and the United Kingdom in the value of its manufactured products. Iron and steel manufacturing are the chief forms, especially in the valley of the Ruhr and the tributaries of the Rhine from the east.

The development of the steel industry is one of the chief reasons for the movement of the population of Germany from the country regions to the cities. Essen, the chief steel-making city, has the

largest steel mills in the world. All the larger towns in the Ruhr Valley, however, are famous for their steel products, especially for cutlery, machinery, needles, and firearms.

Germany, with its irregular coast line, good harbors, and excellent supply of iron and steel, could not fail to become a great shipbuilding country. It is surpassed only by the United Kingdom. The largest part of this industry is carried on at the great ports of *Stettin*, *Hamburg*, *Danzig*, and *Kiel*.

Cotton manufacturing is extensive in many parts of Germany, especially at *Cologne*, *Elberfeld*, and in *Saxony*. Woolen manufactures are well developed in the eastern portion near the supply of wool. The largest part of the cotton used in manufacturing is brought from the United States and distributed to the several cities by boats up the Rhine.

Commerce. Germany has a very large amount of internal as well as of

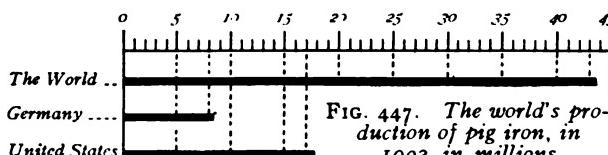


FIG. 447. *The world's production of pig iron, in 1902, in millions of long tons.*

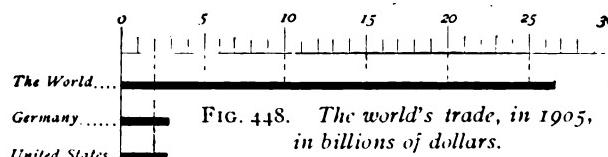


FIG. 448. *The world's trade, in 1905, in billions of dollars.*



FIG. 449. *The museum and the public square of Berlin.*



FIG. 450. A street scene in Munich.

commerce. It is the second of the countries of Europe in its commerce and carries on about one-ninth of the world's trade. The larger portion of its trade is with the United States, the United Kingdom, Austria-Hungary, and Russia. The United States furnishes over 15 per cent of its imports and receives about 10 per cent of its exports. The fine system of canals which has already been mentioned and the splendid network of railroads make internal commerce easy. Germany is second only to the United States in the number of miles of railroad. Its chief imports are cereals, wool, cotton, and metals; its exports include sugar, cotton and woolen manufactures, coal, iron goods, and machinery. Its cotton goods are sent to the warmer regions of Central and South America and its woolen goods to the colder part of South America.

Centers of Interior Trade. *Berlin* is the capital and the chief railroad and manufacturing center of Germany. Owing to its position on the northern plain and its ready water connections with the coast towns, it has also become the chief interior city in trade. It is also famous for its fine art galleries, for its great university, and for its beautiful streets. *Munich*, noted for its breweries, largely controls the commerce between North Germany and the Adriatic Sea. *Breslau*, from its position, commands

the trade with Austria-Hungary and southeastern Europe. *Leipzig* leads in the printing of books and is the chief fur market of the world. *Cologne*, from its position between France and Germany, is a great railway center for trade with the western portion of Europe. It is also noted for its beautiful cathedral, which is one of the finest buildings on the continent. *Danzig* exports the timber and wheat which are brought to it down the Vistula. *Dresden* exports great quantities of metal goods, and *Magdeburg*, *Hanover*, and *Brunswick* have a large sugar trade, owing to the extensive development of sugar refineries.

People. The agricultural people of Germany have acquired habits of thrift and perseverance because they have been compelled for generations to secure their living from a soil that is nowhere extremely fertile. In spite of such difficulties Germany has progressed very rapidly within the last three decades. The people have increased greatly in numbers, have improved their machinery and methods of agriculture, and have taken an important position in the commercial and industrial world. This progress is undoubtedly due in large part to the excellent system of compulsory education, and to the fact that many weak and independent states have been consolidated into a great empire. Science and learning have been fostered, improved machinery has been invented, and the people as a whole have become more highly educated than those of any other country.



FIG. 451. A German town built on a small plateau.

The Germans are naturally home-loving and quiet, painstaking and thorough; they are less impetuous than the French. These qualities the Germans have carried with them when they have emigrated to new countries, as they have in large numbers to the United States.

Scenery. Germany is one of the most interesting countries of Europe. Its great advance in industries, its very old and renowned educational institutions, and its many historic cities attract many visitors to it each year, not only from other countries of Europe, but also from the United States.

The valley of the Rhine is one of the most famous in the world for its beauty. The broad, winding river deeply set in its narrow, steep-sided valley, and with its slopes largely covered by vineyards and fields, makes a very picturesque and interesting route of travel. The many cities of historic interest along its banks also make this a favorite route for entering Germany. (See Figs. 441 and 452.)

Questions and Exercises

(1) On the margin of an outline map of Central Europe write the name of a place in North America in the approximate latitude of Munich; of Hamburg. (2) Compare the latitude of Germany with that of the United States. (3) Does the sun set earlier at Berlin or at Quebec?

(4) Make a list of the countries which border Germany and mark with a star those which are separated by mountains. (5) On the map used in Exercise 1 write the names of these countries and the bordering mountain ranges. (6) Describe the coast which borders on the North Sea; on the Baltic Sea. (7) Where would you expect to find sand dunes? Dikes? Marshes? (8) Consult the temperature maps and tell whether the Baltic ports are free from ice during the winter. (9) Why is Hamburg a more important port than Bremen? (10) What canal,

which has been recently constructed, has promoted the trade of the ports along the coast of the Baltic Sea? What effect may the opening of this canal have on the commerce of Hamburg?

(11) Fill out the following chart:

RIVERS OF GERMANY			
Names	Source (Country)	Mouth (Country)	Chief Towns

(12) On your outline map draw the rivers of Germany. (13) What large tributaries has the Rhine from the east? (14) What towns are situated at the junction of these rivers with the Rhine? (15) Find out what Rheinstein means. Why were castles built in such places? (16) Consult a map of Europe and tell about the importance of the Rhine as a great avenue of traffic for the continent.

(17) Make a list of the chief products of Germany; opposite each write the locality or region in which it is found, and mark with a star those products in which Germany stands foremost.

(18) On an outline map of Europe color the chief mineral regions of

Germany and locate the manufacturing towns.

(19) What towns have manufactures similar to those of Birmingham and Manchester? (20) What are some of the advantages of position by which Hamburg has attained the rank of one of the large ports of the world? (21) What important railroads cross at Berlin? (22) Trace the railroad between Paris, Berlin, and St. Petersburg, and name the large towns along its route. (23) What main roads converge at Munich? (24) Trace the railroad between Paris, Munich, and Vienna, and name the towns on this road. (25) What are the advantages of the position of Cologne? (26) What roads converge there? (27) Locate and give reasons for commercial growth of Mannheim, Breslau, Magdeburg, Dresden, and Leipzig. (Consult commercial and physical maps.) (28) Compare the industries of Germany and the United Kingdom; those of Germany and the United States. (29) What part of the United States has industries similar to those of the Ruhr Valley?



FIG. 452. *The famous Rheinstein Castle on the Rhine.*

LIX. SWITZERLAND

Surface and Drainage. Switzerland is a small republic about twice the size of Massachusetts and lying in the very heart of Europe. It has no seacoast and more than one-half of it is occupied by mountains.



FIG. 453. *Lake Geneva.*

Between the Alps lying on the south and east and the Jura on the northwest there is a high valley, averaging about 1,300 feet in altitude, which forms the agricultural section of the country.

The rivers, because of the distribution of the mountains, flow outward in every direction. They are mostly too swift for navigation, but are largely used for floating timber. The several large and beautiful lakes, however, are important for internal commerce.

Climate. Owing to the altitude of Switzerland and to its position on the continent, it has a cool climate. Its rainfall is about as great as that of the eastern United States. Above the height of 8,500 feet there is eternal snow, so that the higher altitudes abound in glaciers and snow fields.

The vigorous winter climate is often modified by warm winds which blow over the mountains from the south. When there is a storm area over Germany the air is drawn in from all sides. That which comes from southern Europe loses a large part of its moisture as it rises to cross the Alps. Descending on the north side of the mountains and growing

warmer as it descends, it becomes more and more able to take in moisture; it melts the snow and brings unusual warmth to Switzerland.

Products of the Soil. Agriculture is an important industry in Switzerland although the amount of land that can be devoted to that industry is small. The only agricultural product of value in trade is wine, which is made from grapes raised on the sunny slopes of the Jura and the Alps. (See Fig. 454.)

Grazing is very important; nearly three-fourths of the land not covered by forests, ice, or snow is devoted to this industry. (See Fig. 376.) The cattle and the goats are driven to the higher regions in summer and to the lowlands in winter. From the products of the herds cheese and condensed milk are made. The mountain villages also supply the towns in the plains with butter and cream.

Minerals. There is not much iron or coal to be found in Switzerland; salt and building stones are the chief rock products.

Manufacturing. In spite of the lack of fuel and iron, Switzerland is preëminently a manufacturing country. One-third of the people are engaged in this industry, particularly on the plateau and in the Jura. Owing to the position of Switzerland in the heart of the continent, it can easily trade with all its neighbors, and the magnificent power furnished by its perennial and swift streams



FIG. 454. *A vineyard on the slopes in Switzerland.*

affords excellent facilities for carrying on manufacturing. The water power here, as in Italy, is being utilized more and more in developing electricity for manufacturing. Watches and clocks are the leading manufactures. Swiss watches have long been noted for their excellence. Straw plaiting is carried on in the homes of the people.

Cotton and silks are the chief textiles. Silk is produced especially at *Zurich* and *Basel*, where the weaving is done mainly by hand. Cotton also is woven at Zurich and at *St. Gall*. Most of the raw material for



FIG. 455. *Homes built on the mountain slopes of Switzerland.*

this industry is secured from the United States. *Geneva* is noted for its watches and clocks, though many of these are made in other towns and sold under the name of Geneva watches. (See Fig. 456.)

Trade. Owing to the roads that have crossed the mountain passes for centuries and to the modern railroads, some of which pierce the Alps in long tunnels, Switzerland has an excellent opportunity for trade with the north and with the ports on the Mediterranean. It has to import coal, gold for its jewelry, raw silk, and food stuffs. It secures cotton, wheat, and petroleum from the United States. The chief exports are silks, cottons, watches, machinery, cheese, condensed milk,



FIG. 456. *Approaching the city of Geneva.*

and embroideries. The principal part of the trade is with Germany, the United Kingdom, France, Asia, and Italy. The most important trade center is *Zurich*, which, from its situation, is the point of convergence of several railroads.

People. Each of the several states or *cantons* of Switzerland can almost be said to have a different type of inhabitant from any of the neighboring cantons. The mountainous character of the surface does not favor the ready intermingling of the people. Each valley is a more or less isolated region, and hence the inhabitants have little chance to exchange ideas with their neighbors. The mountain peoples are not so intelligent and educated as the people of the valleys. Thus there is no such uniformity of customs or similarity of ideas as is found in a nation upon a plain where people can readily mingle. In spite of these conditions, however, the Swiss have a strong love for their country, as is characteristic of almost all mountain peoples.

The Swiss are painstaking and deft in their handiwork, as is evidenced by their success in wood carving and jewelry work. The mountaineers are brave and daring and make excellent guides. In fact they are the best mountain climbers in the world, and their services are nearly always secured by those who desire to climb difficult peaks in other countries.

Scenery. Switzerland is noted the world over for its great glaciers, its magnificent mountains and lakes, and for the grandeur of its scenery. (See Fig. 457.) Therefore it is more visited by tourists than any other country in Europe. It is estimated that more than a million and a half of people visit this small country annually, and there are over 1,900 hotels primarily for the accommodation of these strangers. The receipts in

money from the tourists are almost as great as the value of the watches and clocks which are sold. Hence the caring for tourists is one of the leading occupations of the inhabitants.

Questions and Exercises

(1) Make a list of the countries and mountain ranges which border Switzerland. (2) Find the main divide from which many of the large rivers of Europe flow. (3) Draw a diagram of this with the outflowing rivers; make the diagram as complete as you can. (4) Name the rivers that flow through lakes. What effect has this on the sediment in the river? On the area of the lake? (See page 28.)

(5) What rivers flow from Switzerland? (6) Tell something you have seen or read about the character of these rivers. (7) Tell what you know about a glacier.

(8) Why is so much manufacturing done in Switzerland? (9) Why should the Swiss be

such famous railroad builders? (10) Why are they so advanced in the use of electricity?

(11) On an outline map locate Zurich and draw routes by which the chief imports and exports come in and go out of Switzerland. (12)

What railroads cross at Bern? (13) What town is on the border between Germany and Switzerland?

(14) Tell something of either Switzerland or its people that interests you.

(15) Compare the scenery of Switzerland and Norway. (16) Why should there be hotels near the tops of the larger mountain passes? (17) Find out about avalanches.



FIG. 457. A glacier high up in the Alps. Notice the stream which flows from under the ice.



FIG. 458. Looking down the valley of the Arno River from Pisa.

Surface and Drainage. Italy is a long peninsula nearly as large as Georgia and Florida. The kingdom also includes the islands of *Sicily* and *Sardinia* and many small islands along the coast. The larger part of

the country is occupied by the Apennines and the southern Alps. The Alps slope down abruptly to the great plain of *Lombardy*, which constitutes the larger portion of the lowlands of Italy. To the west of the Apennines from Genoa to Naples is a hilly country covered by materials thrown out by old and long extinct volcanoes and by detritus brought down by the rivers.

All the good land is in the plain of

Lombardy or close to the coast, so that nearly one-fourth of the people live within three miles of the sea. (See Fig. 369.) In the Alpine region there are many large and beautiful lakes, which act as reservoirs for holding back the water that comes from the snow and rains of the mountains.

Owing to the abrupt slopes there are few long rivers in Italy. The longest is the *Po*, which with its tributaries is navigable for about six hundred miles.

In the south of Italy and on the island of Sicily are two of the most famous volcanoes of the world, *Mount Vesuvius* and *Mount Etna*. (See Figs. 69 and 459.) Vesuvius is always quietly active with dangerous eruptions every few years. (See page 40.)

Climate. The climate of Italy is in many ways similar to that of the Iberian Peninsula because it lies in the westerly wind area in the winter, while in summer the dry southerly winds sweep over it on their way toward the interior of the continent. The larger part of the rainfall therefore comes in winter. Italy, like Spain and Portugal, is protected from the cold continental winds of the north by a high mountain barrier. On the east, south, and west it is bathed by the Mediterranean. The climate, therefore, is

largely determined by the nearness of the sea, and is warm and even in consequence. In fact the temperature rarely falls below the freezing point except in the higher altitudes. The Mediterranean coast about the Bay of Genoa, known as the Riviera, has such a balmy winter climate that it is a noted winter resort. (See Fig. 460.)

Owing to the fact that most of the rain falls in winter, the summers are dry and irrigation is necessary for successful

agriculture, as it is in the other countries of southern Europe. In the lowlands, where there is an abundance of moisture and where the temperature is high, the climate is unhealthful. Malaria, which results from such conditions, may almost be called the national disease, as more than one-sixth of the people of Italy are afflicted by it.

Products of the Soil.

The abundant sunshine and the fertile soil make Italy essentially an agricultural country. In the irrigated regions from six to ten crops are raised each year. Owing to the variety of climate prevailing in the different altitudes on the

mountains, Italy can raise all the crops of northern Europe and many of those of the subtropical regions. In the basin of the *Po*, with its warmth and abundant water supply,



FIG. 459. *The crater of Mount Vesuvius.*



FIG. 460. *Rapallo, in the Riviera. The climate here is so delightful that the hotels seen on the slopes are always crowded with visitors.*

rice is the chief crop. Indeed, more rice is raised here than in any other country of Europe. Olives are raised all through the peninsula and olive oil is an important product.

Italy is second to France in the production of wine, and this together with oranges and lemons is the staple product. Raw silk is also important; more than 6,000,000 people are engaged in raising silkworms. (See Fig. 463.)

In those regions where the climate is especially favorable for agriculture every available spot is used. The steep slopes are broken into steps by a series of terraces, the tops of which are cultivated. Thus here, as in many other parts of Europe, the fields are laid out in a regular plan on the steep hillsides and are very picturesque.

The animal products are not important, except for skins secured from goats raised in the mountain regions.

Minerals. Iron is found in Italy, but is not mined to any extent. Coal is not found; manufacturing is therefore carried on at a great disadvantage. The principal rock products are sulphur and Carrara marble, which is much used by sculptors. The island of Sicily produces from its volcanic fields more sulphur than any other country in the world.

Fisheries. Owing to the fact that Italy has a coast line more than four thousand miles long and indented by many good harbors, fishing is easily and profitably carried on. But so great is the demand that not

enough is secured for home consumption. Sponges, sardines, and oysters are the chief ocean products which are of importance in trade. Red coral, which is much used in making jewelry, is secured along the west coast.

Manufacturing.

Owing to the difficulties we have mentioned above, manufacturing is backward, though it is constantly improving. The increased use of the abundant water power and the development of electricity from the falls have greatly stimulated manufacturing. Silk is produced about Milan. Straw goods, at Leghorn, Venetian glass, and coral jewelry are also important manufactured products.

Trade. Because of the nearness of Italy to Africa and the Suez Canal it has an important carrying

trade for the other nations of Europe. Owing to the railroads which connect it with the other countries, it is also able to carry on an extensive inland trade. For the same reason the larger part of its exports to the other countries of Europe go by land in spite of the



FIG. 461. On the Grand Canal, Venice, with the island of Saint George in the distance.

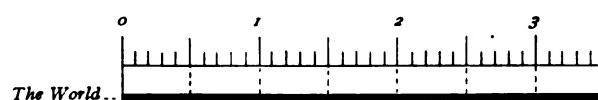


FIG. 462. The world's production of rice, in 1899, in billions of bushels.

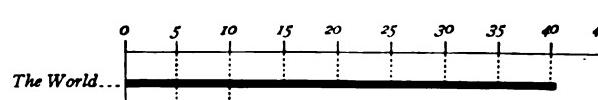


FIG. 463. The world's production of raw silk, in 1902, in millions of pounds.

fact that the harbors are good and numerous. The most important ports are *Venice*, *Genoa*, and *Naples*. Genoa, on account of its position and its excellent railroad connection with the interior, receives large amounts of the products of Germany in transit to Mediterranean ports and the Far East.

The chief imports are cotton, coal, cereals, silk, and timber; from the United States come also machinery and tobacco. The chief exports

are raw silk, cottons, silks, olive oil, sulphur, eggs, and wine. Trade is largely with Germany, the United Kingdom, United States, France, and Austria. The imports from the United States are increasing in value, but the exports to our country are unimportant; they consist mainly of wine, fruits, and sulphur. The leading commercial cities are in the north where the valleys of the Alps and the Apennines converge. *Bologna*, *Turin*, and *Milan* are the chief trade centers in the interior. (See Fig. 465.)

People. The people of Italy are descended

from many different races, but they are now united by the common Italian language, which is very similar to the Latin language used by the Romans. Like other peoples in semi-tropical countries, the Italians are impetuous, quick-tempered, and somewhat

easy-going. They are fond of festivals and sports like the Spanish, and dress in bright-colored costumes.

The Italians have developed agriculture and manufacturing more than have the Spaniards, and Italy as a result is a progressive nation, though not one of the great nations of the world.

Scenery. The volcanoes, mountains, and lakes, of which we have spoken, are visited by many tourists, but the principal

places of interest are those which are noted for their history, for their healthful conditions, or for their art treasures.

Rome, the capital, was once the most important city in the world, and now contains many ruins which are signs of its former splendor. (See Fig. 466.) It is also famous

for its art galleries which are much visited by tourists and students from all parts of the world. Among its noted buildings are St. Peter's, the largest and most famous church in the world, and the Vatican, an enormous pal-

ace occupied by the Pope and containing a wonderfully interesting library. The Pope is the head of the Roman Catholic Church with its enormous membership in all the leading countries in the world. Rome is also the residence of the king of Italy.

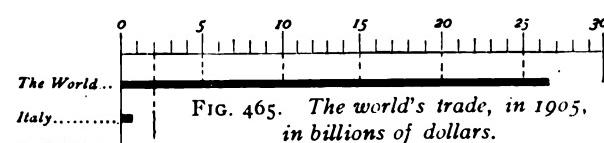
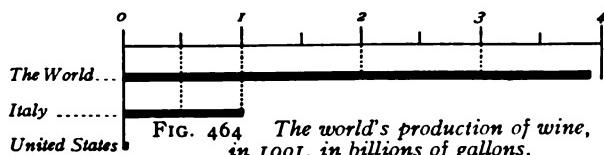


FIG. 466. Ruins of the Forum, Rome.

Venice, the city in the sea, is built on more than a hundred small islands, and travel is largely by means of boats or gondolas which traverse the many beautiful canals. (See Fig. 461.) It is full of beautiful palaces and churches, which, like the palaces of Spain, are relics from a former period of richness and splendor. The water and the clear blue sky both add to the general beauty of the region, so that it is a favorite resort for artists.

Florence, with its great olive gardens and its world-famous art galleries, is another city much visited by tourists and artists. *Naples*, the largest city of Italy, is situated on the beautiful bay of the same name and has the constantly threatening Mount Vesuvius in the background. Other cities which are much visited are *Syracuse* in Sicily and the small towns along the Italian Riviera.



FIG. 467. *The Cathedral, Milan.*

Questions and Exercises

(1) From what countries do the Alps separate Italy? (2) Name some Alpine peaks which are on or near the border of Italy (3) Compare the height of the Apennines and the Alps. (4) Locate Mount Vesuvius; Mount Etna.

(5) What is the difference between the tributaries of the Po from the north and those from the south? (6) Name the lakes in northern Italy and tell something about their surroundings. (7) In what part of Italy are large cities most numerous? What is the reason for this? (8) Why is Venice no longer an important port? (9) Why was it once a leading commercial city? (10) Why do so many Italians come to the United States? (11) What do they do here?

(12) What is the average temperature of the Mediterranean for January? (13) What

influence does this have upon the winter temperature of southern Italy? (14) How does the Mediterranean affect the summer temperature? (15) What is the chief factor which determines the rainfall of Italy? (16) What part do the Alpine lakes play in the productiveness of Italy? (17) Why are large portions of the Apennines unforested?

(18) What natural feature of Italy promotes the use of electricity? (19) What influence will this have upon manufacturing in the future?

(20) On an outline or sketch map of Italy draw the Alps and the Apennines, the Po and its tributaries, the Arno, and the Tiber. (21) Draw the January isotherm of 40° and the July isotherm of 75° . (22) Locate the three important

trade cities of the north; also Genoa, Venice, Florence, Rome, and Naples. (23) Make a list of the exports of Genoa and Naples. (24) Find out the route which a letter mailed in Paris for Bombay would take and put as much as possible of this on your map. (25) Draw in red the ocean trade routes from Italy to New York and from Italy to the East.

LXI. AUSTRIA-HUNGARY

Size and Surface. Austria-Hungary, which is as large as Wisconsin, Minnesota, Iowa, and Missouri, is one of the most varied countries of Europe. It contains almost every kind of surface, from high, rugged mountains to almost unbroken plains. It is an inland region, with the exception of a short, inaccessible coast on the Adriatic, on which Trieste is the only important port (see Fig. 468), and is practically surrounded by mountains. It includes the high eastern Alps, the Bohemian Plateau, nearly the whole of the Carpathians,



FIG. 468. Trieste.

part of the *Dinaric Alps*, which lie mostly in the Balkan Peninsula, and the great level Plain of Hungary.

Climate. Austria-Hungary is extremely varied in its climate. On the coast the climate is that of the adjoining ocean. In the southern provinces the winters are mild and the summers dry, as they are in most Mediterranean countries. In the interior the winters are very cold and the summers hot, while in the eastern portion the plains belong to the great dry steppe region of Eurasia.

Products of the Soil. Austria-Hungary is preëminently an agricultural country, owing to its climate and soil. About two-thirds of the people are farmers and more than three-fifths of the total area is devoted to field crops, pasturage, and hay. (See Fig. 470.) Owing to the fact that the region is generally dry in the summer, droughts are frequent, and crops sometimes fail.

The country as a whole is a great cereal-growing region and the large crops of wheat in the Plain of Hungary make it one of the great granaries of the world. (See Fig. 469.) Rye is raised in the colder mountain areas, maize is grown in the sunny south, and oats

are an important crop in Hungary and northern Austria while the sugar beet is cultivated extensively, especially in Austria. The vine also is cultivated in Hungary, which produces some of the finest wines in the world.

Forests abound in the highland areas of the northwest and in the Carpathians, and furnish products largely made into wine and beer casks for use in France, Italy, and Germany.

Stock Raising. The country as a whole raises more horses than any other country in Europe except Russia. Mules are raised in large numbers in the drier and warmer steppe regions. Poultry is very important in those regions where the underlying rock is limestone and hence well drained, so that the surface is dry. Cattle are raised and dairying is carried on in the higher pastures of the Alps as in Switzerland and France.

Mining. Austria-Hungary abounds in coal and iron, but they are little worked. Most of the coal produced is mined in Bohemia or in the region north and south of Vienna. Indeed it is the proximity of good coal

that determines in a large measure the importance of the manufacturing which centers at Vienna, the chief city of the country.

Manufacturing. Manufacturing has developed slowly, largely because of the lack of new machinery and modern methods, and also because the country has poor connection

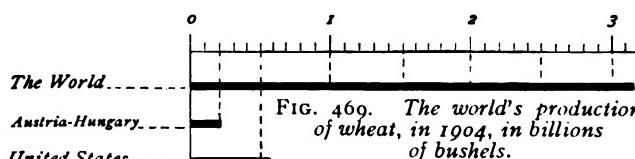


FIG. 469. The world's production of wheat, in 1904, in billions of bushels.



FIG. 470. Haying near Lins in Austria.



FIG. 471. *Threshing grain in Bosnia.*

with ocean ports. It is best developed in the north and the northwest, where for that reason the population has become most dense.

Budapest, the capital of Hungary, is a great milling city; its dry atmosphere is especially favorable for the milling of wheat into the best of flour. (See Fig. 472.)

Textiles are on the whole the leading products of the country. Carpets and silks are manufactured at *Vienna*.

Gloves and leather goods are made at *Vienna*, *Prague*, and in the *Tirol*. Most of the leather, however, comes from the highlands of Hungary and the Balkan Peninsula.

Another product of Austria-Hungary that is of great importance is Bohemian glass, noted for its beauty of coloring.

Trade. The passes which connect the country with its seacoast on the Adriatic and the gap of the Danube at the Iron Gate are the chief outlets for trade. The few railways center at Vienna and at Budapest.

Vienna is located at the crossing of the chief north-south and east-west routes and hence is the leading commercial city. (See Fig. 376.) The natural highways now followed by the railroads, which converge at Vienna, have been of importance as trade routes since the earliest times. Therefore, Vienna has long been the chief city in Austria, and is one of the most interesting ancient

cities of Europe. It has many fine buildings and a noted university. (See Fig. 473.)

The railroads are more important than the rivers because the latter flow into interior seas. The Danube, with its trade with eastern and southeastern Europe, is the most important water route.

The imports are chiefly wool and cotton for the textile mills, coal, and tobacco. Cotton is brought from Egypt and the United States. The United States also sends maize, swine products, and pig iron. The chief exports are sugar, eggs, pottery, and beer to other countries. The larger portion of the trade is with Germany and the United Kingdom. The United States is third in the import trade of Austria-Hungary, but receives few of its exports.

People. Austria-Hungary is a country of many nationalities and many languages. Though the Germans are most numerous in the north and the Italians in the southwest, there are but three provinces in which only one language is generally spoken.

Scenery. Austria-Hungary is an interesting country in which to travel. Its two chief cities are much visited, Vienna because of its present progress and its interesting history, and Budapest because it is one of the most accessible of the cities which are distinctly eastern or oriental in character.



FIG. 472. *Budapest.*

Bohemia and the Tirol are the regions most admired and visited by tourists on account of their natural beauty. The Tyrolese mountaineers, with their striking and picturesque costumes and with their villages placed among the beautiful mountains, attract many artists to this region.

Questions and Exercises

(1) Name the countries and mountains that border Austria-Hungary. (2) What can you say of its coast line? (3) What geographical reason can you give for the fact that Austria is a difficult country to govern?

(4) What part of Austria-Hungary has a mild climate? A dry climate? Cold winters? Heavy summer rainfall?

(5) In what way is the Danube the key to the whole country? (6) What are its tributaries? (7) Where is the Iron Gate, and why is it so called? (8) Where would the people of Vienna be likely to go for summer outings?

The citizens of Munich? (9) What can you say of the forests of Austria-Hungary? (10) For what products and manufactures is it important? (11) What are the chief imports, and from what countries do they come? (12) Why should leather goods be an important export? (13) Compare the chief industries of Minneapolis and Budapest. (14) In each case tell why this industry is located here. Compare the climate of the two cities, their position, and their population.

(15) How many lines of traffic cross at Vienna? (16) What reason can you give for this? (17) On a map of Europe trace two routes from Moscow to Marseilles; two from London to Constantinople. (18) What city lies at the crossing of these routes? (19) Consult the product map and tell what natural products are found near Vienna. (20) Why

has it grown to be a manufacturing city? (21) Why is the term "Gate City" appropriate to Vienna? (22) Find a "Gate City" in the United States. (23) Draw a diagram showing routes by which goods may be sent from Budapest.

LXII. ROUMANIA AND THE BALKAN PENINSULA

ROUMANIA

Surface. Roumania is for the most part a continuation of the great plain of Russia, which has already been described. It also contains the delta of the Danube River, the largest channel for internal trade in Europe. It is separated from the Balkan Peninsula by the Danube River, and is bounded on the west by the Transylvanian Alps and

the great wall of the Carpathians.

Climate; Products; Cities. Owing to the inland position of Roumania, it has a great annual range of temperature and, like most regions in similar locations, has its rainfall in the early summer. The rainfall decreases toward the southeast, so that this portion of the country is a pastoral region. The rest of the area is a great granary, raising maize and wheat, which thrive here, owing to the abundance of sunshine. The larger part of these cereal products is sent to the United Kingdom and Belgium.

Bukarest, the capital, is a great trade center situated at the crossing of two railroads from



FIG. 473. *The public square and market in Vienna.*

Austria-Hungary to the Black Sea; *Galatz*, from its position on the Danube, carries on trade with Germany. The other towns are small and unimportant in trade.

THE BALKAN PENINSULA

Surface; Importance. The Balkan Peninsula is a distinctly mountainous country, one of the most mountainous in Europe, and includes the several countries, *Servia*, *Bulgaria*, *Montenegro*, *Turkey*, and *Greece*.

Forming as it does a land bridge between the prosperous regions of Europe and the most densely inhabited countries of Asia, the Balkan Peninsula is a great highway of trade. Two important railways follow the natural depressions between the mountains and connect Constantinople and Salonica with Belgrade and thence with the cities of Austria-Hungary.

Climate. The center and the east coast of the Balkan Peninsula have a continental climate with cold winters and warm summers. The greatest rainfall is in summer when the southwest

monsoon winds bring moisture from the Mediterranean. The east coast along the Aegean has mild winters and the Adriatic coast has a much warmer winter than is found along the Black Sea. Eastern Turkey is largely a steppe area, owing to the extreme dryness.

Products. Forests cover vast areas of this region and in the forests many sheep and goats are raised, especially in Servia and Greece. These animals feed on the acorns and the beech nuts. In the warmer valleys maize, tobacco, and cotton are raised, but agriculture on the whole is not well developed.



FIG. 474. Roumanian peasants spinning in their cottage.

COUNTRIES

Servia. Servia, because of its position, exports a large portion of its swine, cattle, and agricultural products to Austria-Hungary. *Belgrade* is the chief center of trade, and about this city carpets and cotton and silk goods are manufactured.

Bulgaria. Bulgaria is in part fertile and prosperous. Its most valuable products are grain, animals, and the *attar of roses*, a very delicate perfume made from rose leaves. *Sofia* is the chief town and trade center, owing to its position on the Constantinople-Belgrade Railroad.

Montenegro. Montenegro is a small and unimportant country which is so mountainous that stock-raising is the chief industry. It also does some fishing, but its total products are so few that nearly everything except food has to be imported.

Turkey. Turkey in Europe is a small country only about as large as Wisconsin. The greater part of the Turkish possessions, forming the rest of

the Turkish Empire, are in Asia Minor and in Arabia, though Turkey also has considerable territory in northern Africa. The empire is ruled by a despot, known as the Sultan, who is also the head of the Mohammedan church. It is the only non-Christian country in Europe, and owing to its bad government and its continual persecution of people of other religions, it is very backward in business and enterprise.

Turkey exports fruits, tobacco, mohair, and silk in small quantities, and imports the larger part of its food products and



FIG. 475. *The city of Constantinople.*

manufactured goods. *Constantinople*, on a beautiful harbor known as the Golden Horn and at the crossing of the land and sea routes to the east, controls the commerce on the Black Sea and is the principal port. *Salonica* is the second port and town in importance.

Greece. Greece has neither fuel nor power, so that it is not adapted to manufacturing. It has few railroads or highways. It does have many fine harbors, however, and large numbers of the people are engaged in fishing. In early times its enterprising mariners controlled the commerce of the Mediterranean. Its people have always been seafarers. Fruits are raised in certain areas by means of irrigation, and some kinds of small grapes are dried and exported as currants. Textiles and leather-working, carried on in the homes of the people, are the only manufactures of any importance.

The chief town is *Athens*, the capital, once the most famous city of the world, and the leader in the arts, poetry, and sciences of ancient times. Athens, like Rome, abounds in evidences of its former greatness, and is much visited for its historic places of interest and because of its many impressive ruins. The most noted and beautiful ruin is that of the Parthenon, an ancient temple situated on a high hill overlooking the city and known as the Acropolis.

Questions and Exercises

(1) Which of the Balkan countries are bordered by the Danube? (2) Explain the importance of the location of Belgrade; of Bukarest; of Salonica; of Constantinople.

(3) Why should Montenegro have a milder climate in winter than Roumania? (4) What are the chief products of these countries? (5) Trace the routes by which the exports are sent out of these countries to New York.

(6) Describe the coast of the Aegean Sea. To what land form do the islands in this sea really belong? (7) Why would you expect the Greeks to be a seafaring people? (8) Why are they not to-day a great carrying nation? (9) Why was it easy for the Greeks to go across to Asia in early times? (10) Locate Athens and tell something of its past history. (11) What famous building was located at Athens? (12) Find out if many Greeks migrate to the United States, and what they do here.

SUMMARY

Western Europe, with its moist climate and large area available for occupation, is

densely inhabited, while the population grows more scanty toward the east, where the dryness precludes occupations which permit people to live closely together. The continent has a great variety of climate and surface and an extensive coast line. Thus nearly all the nations have ready access to the sea, even though they have no seacoast. Within its area have grown up the countries of the world which are most important, not only for their present progress and wealth, but because of their influence upon the world as a whole throughout several centuries. The great nations of Europe have been the leaders in exploring and colonizing the world, and the United Kingdom, Germany, Norway, and Sweden still lead in the work of exploration. Our country was not only explored and developed by Europeans, but our customs,

laws, speech, and racial characteristics all show the influence of Europeans. The present position of the European nations is shown by the fact that their influence is important in international affairs the world over. The weaker nations are protected by the stronger, and no small nation can take any step that will produce a change in the political geography of Europe without the approval of the so-called Great Powers. The United Kingdom, Germany, France, and the Netherlands have

together more than three-fourths of the trade of the continent, while the continent as a whole has three-fourths of the commerce of the world. The importance of Europe to the United States is clearly indicated by the fact that one-third of our commerce is with the United Kingdom, Germany, and France.

The importance of Europe in trade is best shown by the fact that the United Kingdom, the United States, Germany, Norway, France, and Italy in the order named have the largest merchant fleets. The development of commerce and the possession of dependencies in other parts of the world have caused the United Kingdom, France, Germany, and Italy to have



FIG. 476. *The city of Thera, on a volcanic island in the Aegean Sea.*



FIG. 477. *Grazing in a dry valley of Greece.*

the four largest navies in the world, while the United Kingdom, Germany, and France, together with the United States, are the chief commercial nations of the globe.

AFRICA

LXIII. THE CONTINENT AS A WHOLE

Size and Outline. Africa, next to Asia, is the largest continent, but it is outranked in population by both Asia and Europe. (See Fig. 28.) It lies very close to Europe and is joined to Asia by the narrow isthmus of Suez. Africa extends from the latitude of Richmond, Virginia, to that of Buenos Aires; hence it lies almost wholly in the tropics. The coast line is regular; the continent has no deep estuaries or pronounced peninsulas, and therefore possesses few good harbors.

There are no important islands bordering the coast of Africa. *Madagascar*, the largest island, is not connected with the continent by any shallows, and hence is an oceanic rather than a continental island. (See Fig. 481.)

Surface. The surface of Africa consists for the most part of a series of great plateaus with mountain ranges rising above them, and a narrow hem of lowlands along the coast. The average altitude of the land in the northern half of the continent is under 2,000 feet, although this portion contains the *Atlas Mountains*, which rise to a height of more than 14,000 feet along the northwestern coast. Just to the east of the Atlas range is a small area below sea level.

Another highland runs northeast and southwest across the continent from a point on the

western shore of the Red Sea to a point north of the Gulf of Guinea.

The average elevation of the rest of Africa is about 4,000 feet. This region includes the *Plateau of Abyssinia* on the east, the most important highland of the continent. The Plateau of Abyssinia extends to the south, and is really continued into the *Kwathlamba* or *Drakenburg Mountains* of South Africa, although the highland is discontinuous through a portion of East Africa. (See Fig. 481.) Very close to the equator a series of old volcanoes rises to a height of 18,000 or 19,000 feet, forming the highest mountains of Africa.

Drainage. Although Africa contains some of the largest and longest rivers in the world, it is more deficient in routes for interior water commerce than any other continent. Each of the great rivers is interrupted somewhere in its lower course by a series of falls which act as a barrier to trade and travel. It is in part for this reason that the exploration of Africa has been so long delayed, and that the interior trade is still in a backward condition. The largest streams flow to the Atlantic, as they do in nearly all the continents.

The longest river is the *Nile*, which flows north from the highlands down a succession of terraces into the Mediterranean. (See Fig. 481.) The size of this stream varies enormously at different times of the year. It receives most of its water from its eastern



FIG. 478. *The position of Africa among the continents.*

tributary when the wet seasons prevail in the highlands. (See Fig. 480.)

The *Congo*, flowing down across the interior plateau to the west, is the second largest



FIG. 479. *The rolling surface of the land in the veldt country, South Africa.*

river system of the continent, and one of the largest in the world. It opens up the vast interior forests of Africa, but is so interrupted by rapids that it cannot readily be used as a trade route.

In western Africa, north of the equator, the *Niger* is the principal stream.

In the southern portion of the continent the divide between the east and west drainage is mostly to the west of the highland, so that the large rivers, the *Zambezi* and the *Limpopo*, have to cut through the ridge to reach the sea.

More than a fourth of the continent has interior drainage, a greater proportion than is found in any other continent except Asia. In this region of interior drainage lies the large fresh-water lake, *Lake Chad*, which in times of flood has an outlet to the northeast into a low, salt basin.

Climate. Owing to the position of Africa in the Hot Belt, the climate is everywhere tropical except in the extreme south. In the southern summer Africa lies entirely in the trade-wind region and the region of the doldrums; the northern part in the northeastern

trade-wind belt, the central portion in the doldrums, and the south in the southeastern trade-wind belt. In the southern winter these winds occupy the whole continent north of the southern tropic. As a result the climatic features are very symmetrical on both sides of the equator. (See Fig. 76.)

The rainfall of Africa, except in the equatorial region, is extremely small. Throughout the larger part of northern Africa the annual rainfall is less than twenty inches, though on the northern, or windward slopes, of the Atlas Mountains it increases to more than forty inches in places.

The northeastern trade winds, originating in Asia or in southern Europe, pass over so small an area of water that they do not receive all the moisture they can carry. As they pass over Africa they grow warmer and therefore become capable of absorbing more moisture. Hence they evaporate the moisture from the lands over which they blow, and as a result we find the largest desert in the world in northern Africa. The only rainfall in this desert region occurs on the scattered peaks which rise above the plateaus of the Sahara to an altitude of more than 6,000 feet.



FIG. 480. *Egyptian sailing vessels on the Nile.*

The rainfall of southwestern Africa is under twenty inches; most of it falls in summer when the trade winds bring moisture from the Indian Ocean.

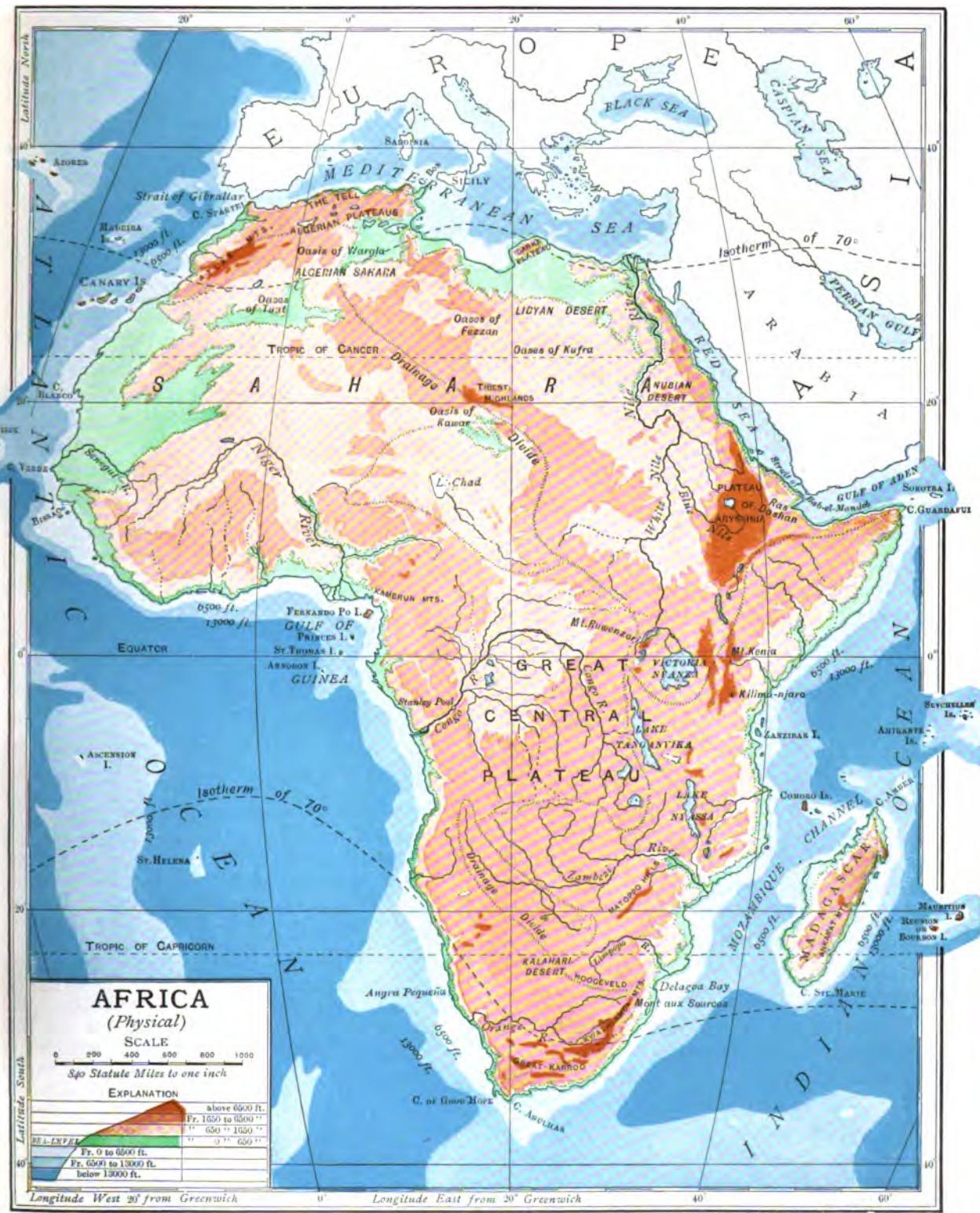


FIG. 481.

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Central Africa, between 10 degrees north and 15 degrees south latitude, is occupied by the doldrum belt and therefore has a heavy rainfall. It is heaviest along the western coast, reaching a maximum in Liberia. Owing to the excessive warmth and moisture and the prevalence of swamps, this region is the most unhealthful in the world. The plateaus of the tropical region, however, rise to a sufficient height to have a climate cool enough for occupation by white people. Even in these more favored sections, however, the climate is so unhealthful that no one yet knows whether or not Central Africa is likely to be permanently occupied by the white race.

Vegetation. The vegetation regions of Africa are distributed in accordance with the distribution of the rainfall. The coastal areas north of the Atlas Mountains are grass regions with trees, and can be cultivated. The southern slopes of the Atlas are a great steppe, which in turn merges into the immense desert of the *Sahara*, with practically no vegetation except in the oases. Grassy steppes are also found south of the *Sahara*, lying between the tropical savannas and the desert. This savanna region grows wider toward the east in the Sudan. (See Fig. 119.)

Central Africa is entirely occupied by open savannas and tropical forests; the forests are more dense than those found anywhere else in the world except in the valley of the Amazon.

In the well-watered regions of the southeast, grasslands and agricultural regions are found. In the southwest is a steppe region with deserts close to the Atlantic coast. This desert region, known as the *Kalahari*, is not so dry as the *Sahara*, as is shown by the fact that it has heavy dews almost every night. The dews are formed, of course, by the chilling of the air, so that some of the moisture which evaporates during the intense heat of the day is again condensed.

Animals. The animals of northern Africa as far south as the northern tropic are like those of Europe. The rest of Africa belongs to the Ethiopian Region, the general features of which have already been described. (See page 75.)

In the savannas are great numbers of antelopes and giraffes which feed upon the grass. Here are found also the carnivora, or flesh-eaters, such as the lion, the hyena, and the leopard, which prey upon the grass eaters. In the forest regions are the tusked elephants, which are now being rapidly destroyed, and the man-like apes. Crocodiles and hippopotamuses abound in all the rivers of the tropical region. Camels and ostriches are found in the desert and steppe areas, and are of great value to man.

People. North of the southern *Sahara* the people of Africa all belong to the white race. In the rest of Africa the native people are blacks, although Europeans are found scattered in the various colonies, and in great numbers in South Africa. (See Fig. 169.) The blacks abound in the Sudan and in tropical Africa, and the Bantus, or light-colored blacks, are found in South Africa. In the Congo forests are the primitive and dwarfed Negritos, the smallest people in the world.

Questions and Exercises

- (1) Write a composition comparing Africa and North America, making statements about each as to (a) its position as regards the equator, (b) its distance and direction from Europe, (c) its coast line, (d) its harbors, (e) the effect of its coast line on settlement.
- (2) Study the relief map and tell what influence the eastern highland has upon the rivers which cross it.
- (3) In what latitude is the source of the Nile? The mouth?
- (4) Compare the length of the Nile and the Mississippi in degrees of latitude; of the Zambezi and the St. Lawrence.
- (5) Study the physical and commercial maps and tell which rivers of Africa are most important commercially.
- (6) Why is the Niger of less importance than the Nile?
- (7) Find out something about the Congo.
- (8) Give the reason for rainfall on the high plateaus of the *Sahara*.
- (9) Where is tropical Africa?
- (10) Which

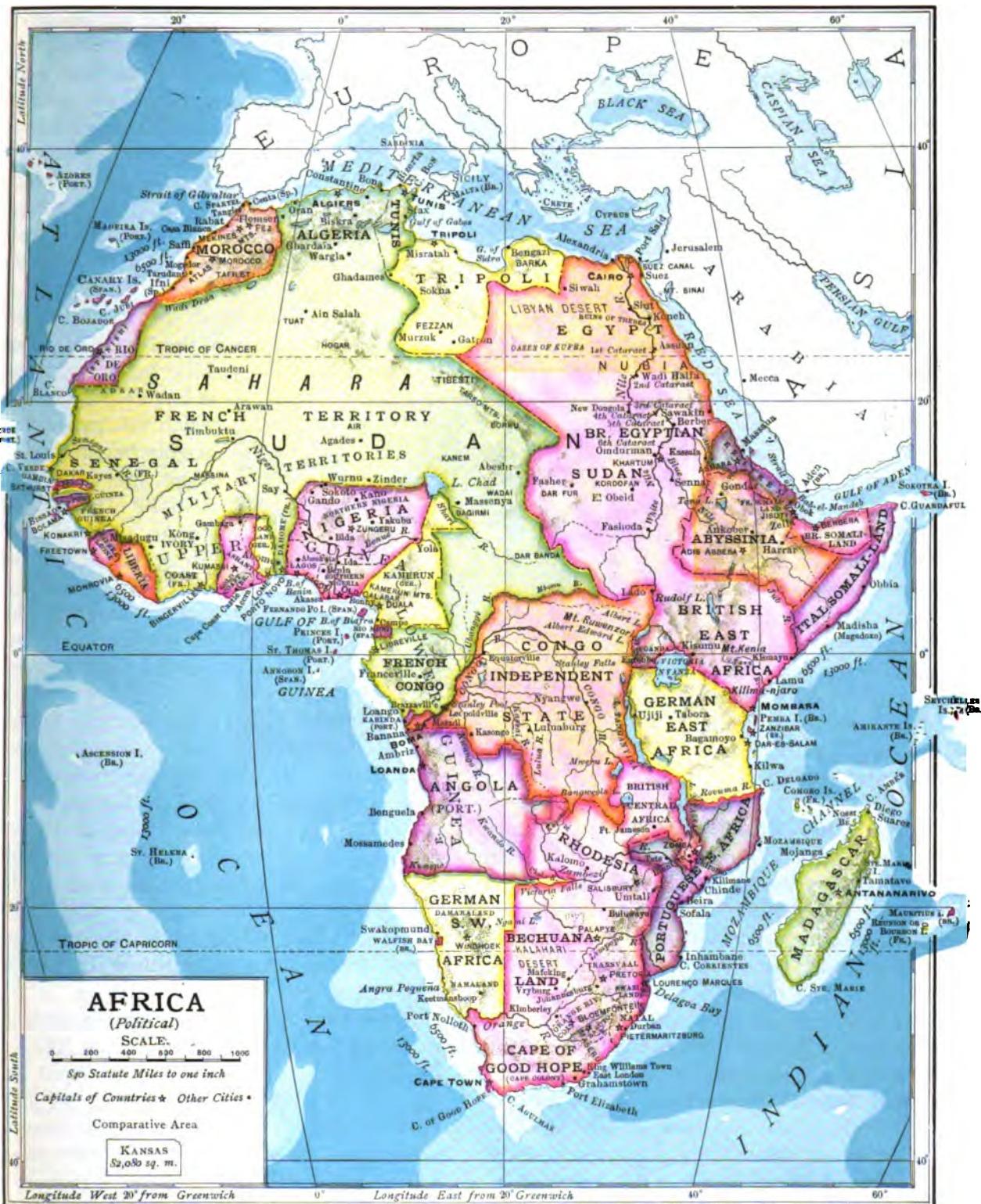


FIG. 482.

part is more likely to be occupied by white people? (11) During what months do the heavy rains of this region occur? (12) Why does the southeastern coast have rain when the interior is dry? (13) Tell why the animals of northern Africa are similar to those of Europe.

(14) Draw on a sheet of blank paper two small sketch maps of Africa. On the first draw the Heat Equator and color in red that part of Africa in the Hot Belt. On the second draw the Heat Equator; indicate the direction of the winds, and the regions of heaviest rainfall.

LXIV. NORTHERN AFRICA

Countries. Northern Africa includes *Morocco*, *Algeria*, *Tunis*, *Tripoli*, *Egypt*, and so much of the northern portion of the Sahara as is under the protection of these countries. With the exception of the coast region of Algeria, all this vast country is a desert in which agriculture can be carried on only by irrigation. Irrigation is practiced extensively about the oases and in the river valleys of Tunis, Morocco, and Egypt.

EGYPT

The Valley of the Nile. Egypt is a tributary state of Turkey, though some of its affairs are managed by the English government. It consists practically of the valley of the Nile with the bordering desert areas.

The Nile, famous for its annual floods, receives the most of its water from the Abyssinian Mountains, where the rainfall is greatest in the summer months. The river begins to rise about the twenty-sixth of June and begins to overflow in September. As the water settles it leaves exposed the flood plain, which it has thoroughly saturated with water and covered with a fine layer of silt. This silt forms a very excellent soil for agri-



FIG. 483. Trading in Egypt.

culture, and therefore farming can be carried on with profit wherever irrigation is possible. The flood plain of the Nile, because of its annual floods, has long been famous as an agricultural region. It is the seat of an extremely ancient civilization, which was made possible by the natural productiveness of the region. Its famous cities have long since declined in importance or have disappeared, but their ruins remain as a witness to the country's former splendor.

Irrigation. Two kinds of irrigation are practiced in the basin of the Nile. In Upper, that is, southern, Egypt the water is gathered

in large natural basins which will irrigate the neighboring region for about two and a half months of the dry season. The principal crops, therefore, are those which will mature in a short growing season, such as beans, clover, wheat, and barley.

In the delta portion the water is pumped from the river, or in

some way distributed over the land so that it can be used at all seasons. Thus, in this section agriculture is possible the year through, and the principal crops are those that require a long growing season, such as sugar cane, dates, and rice, though wheat, maize, and durra, which form the principal food of the people, are raised in large quantities.

A great dam has recently been completed at Assuan, so that the water of the Nile can be held back from November to April and let out upon the lower countries as it is needed. The lake formed in this way is about two hundred miles long. Irrigation can now be practiced in Lower Egypt to a far greater extent than ever before, and it

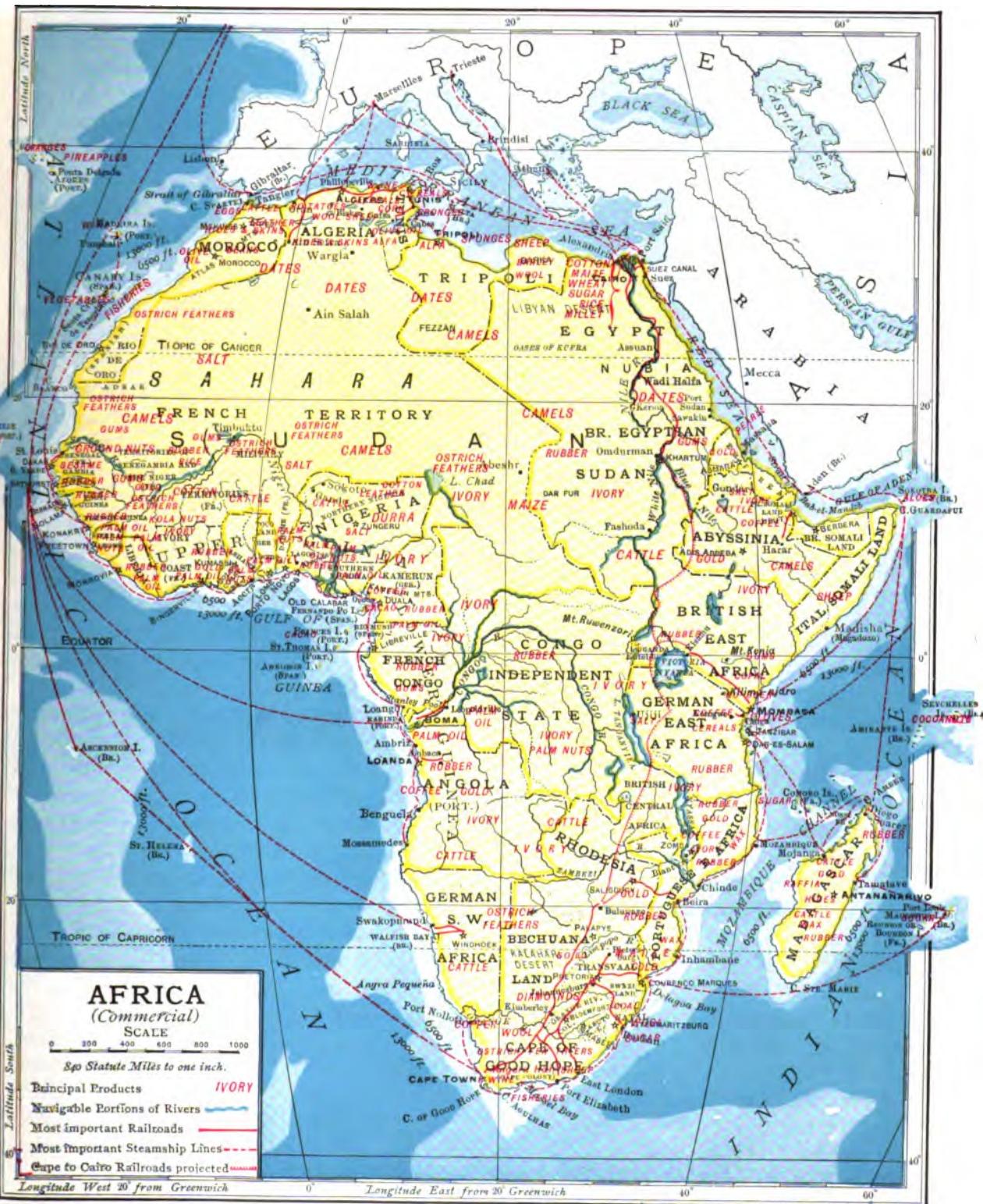


FIG. 484.

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is expected that the area devoted to agriculture will be greatly increased.

Products of the Soil. Upper Egypt produces wheat, barley, corn, clover, and beans. Wheat is the leading crop, and occupies one-half the agricultural area. Lower Egypt raises cotton, wheat, millet, sugar cane, rice, and sub-tropical fruits, such as figs, dates, lemons, and oranges. Cotton is the most important product. Egyptian cotton is very valuable, owing to its long fiber, which is much prized in fine spinning.

Trade. Nearly one-half of the trade of Egypt is with the United Kingdom and one-fifteenth with Germany. The chief exports are cotton and cotton seed; the chief imports are cotton manufactures, coal, wood, and metals. Ivory and rubber are secured from the most southern portions of Egypt. A large quantity of these products is also sent out by way of the west coast. Vast areas in Egypt could be improved but for poor labor and the lack of ready and cheap communication.

Cities. Cairo, a picturesque and ancient city at the head of the delta of the Nile, is the capital of Egypt. Cairo is a favorite resort for tourists who desire to visit the famous Pyramids and the Sphinx, or who wish to take the trip up the Nile. (See Fig. 127.)

Alexandria, at the mouth of the western distributary of the Nile, has long been the chief port of Egypt. Port

Said, at the northern extremity of the Suez Canal, is a coaling station. Through it passes a great quantity of valuable products from the Far East.

The Suez Canal. The Suez Canal from Port Said to Suez is eighty-seven miles long and lies entirely in Egypt. The completion of this canal has

not only greatly shortened the distance by water between western Europe and the East Indies, but it enables vessels to follow a safer route than that around the Cape of Good Hope. (See Figs. 161, 485, and 486.)

About four

thousand vessels pass through the canal annually; a number, however, not nearly so great as that passing through the Sault Ste. Marie Canal in the United States. But it should be remembered that the vessels passing through the Suez Canal are nearly all loaded with goods of such a character that great value is concentrated in a small bulk, so that the wealth passing through the Suez Canal far surpasses that carried through any other canal in the world.

TRIPOLI

Characteristics; Trade. Tripoli is a Turkish province and includes the oases of Fezzan and the small plateau of Barka. The oases are the only rich portion of the region. Tripoli, the only seaport and the chief town, is the northern terminus of many important caravan routes across the Sahara.

The chief exports,



FIG. 485. *The port of Suez, an important commercial distributing point.*

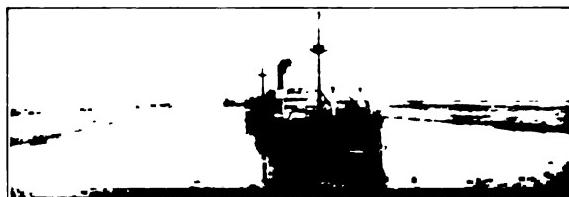


FIG. 486. *Steaming through the Suez Canal.*

with the exception of dates, which are produced at home, are brought to Tripoli by caravans from the interior. They include ostrich feathers, ivory, skins, and gold.

ALGERIA AND TUNIS

Algeria and Tunis are both dependencies of France. Algeria is her richest and most valuable colony, and Tunis is under French protection. Many railroads and highways have been built in Algeria at national expense; harbors have been constructed and artesian wells have been sunk. The people are progressive and the country is increasing in importance.

Climate and Soil.

The climate of both countries is like that of Spain and Italy, distinctly Mediterranean. The most important agricultural region lies on the coast of Algeria and is known as the *Tell*. Another rich region is in Tunis between the Great and the Little Atlas mountains, where the Mejerda River floods the country after winter rains and enriches it, very much as the Nile enriches Egypt. The region south of the Atlas is occupied by nomadic tribes, except where an occasional oasis gives opportunity for permanent habitation. (See Fig. 169.)

Products; Exports. The Tell exports olive oil, wheat, barley, and early vegetables. Alfa grass, which is very important in paper-making, grows on the plateau between the Great and the Little Atlas mountains.

Cork oak is found in both Algeria and Tunis; Algeria exports more

than Spain and Portugal combined. It also exports phosphates, iron, and zinc. Other important exports are dates and excellent wine.

Sheep and goats graze in large numbers in the higher regions, but owing to the scarcity of water during the summer the amount of grazing is limited.

Cities. *Algiers*, the chief port of Algeria, is an important coaling station for Mediterranean vessels.

The Arab portion is situated on a hill with the modern town at its foot.

Tunis, owing to its location, is more important as a port than Algiers. It is connected with the sea by means of a canal so that ocean-going vessels can land at its wharves.



FIG. 487. *A caravan preparing to start across the Sahara.*

MOROCCO

Morocco is an independent Mohammedan country in which European influence has thus far had little effect; indeed, large areas in the country are not safe for Europeans. The surface is rugged except along the coast, and includes the southwestern portion of the Atlas Mountains. Owing to the absence of railroads or highways, all travel is by horse or camel.

Climate; Trade. Morocco has a fine climate, excellent soil, and mineral wealth, especially in copper; but these favorable conditions have been little utilized.

Tangier is the only port of importance in Morocco, and the center of what little trade the country has. The commerce is small and is chiefly with England and France. It includes small quantities of grain, eggs, beans, almonds, wool, oil,



FIG. 488. *A typical village of northern Africa, built on the edge of the great Sahara.*

and some few characteristic manufactures such as Fez caps and leather. The manufactured products are sent, for the most part, to the other countries in northern Africa.

Questions and Exercises

(1) During what season does the upper Nile overflow? (2) How do the people get the water from the river to their fields? (3) What European country is chiefly interested in promoting trade and means of communication in Egypt? (4) Find out what you can about the Cairo and Cape Railroad. (5) Account for the location of Cairo. (6) Compare the rainfall of Cairo and New Orleans. (7) What effect has the climate of Egypt had upon the preservation of its ancient monuments? What do you know about the effect of a more moist climate upon stone? (8) Make a comparison between the Suez and "Soo" canals as to position, width and length, amount of tonnage, value of tonnage, and general importance.

(9) Why should Tripoli be more of a terminus for caravan routes than Tunis? (10) In what ways has French control been of benefit to Algeria and Tunis? (11) Why is Morocco so little developed?

(12) Find out all you can about the caravans of Africa.

LXV. CENTRAL AFRICA

Countries and Ownership.

Central Africa includes all the continent between the northern tropic and German Southwest Africa. Within this vast area there are only three independent states—Liberia, a negro republic, the Congo Independent State, and Abyssinia.

Abyssinia is ruled by an emperor, and the Congo Independent State is to a great extent under the protection of Belgium.

The other countries are controlled by European nations, especially the United Kingdom, France, Germany, Portugal, and Italy. Each of these nations is constantly endeavoring to increase its holdings, and new boundary lines are being established almost every year.

Climate. The climate of central Africa is everywhere tropical in temperature and varies in the amount of moisture from the extreme dryness of the greatest

desert in the world to the exceedingly rainy regions of the Congo Basin. In the lowland regions the climate is extremely weakening for white people, and malaria is common even among the natives. (See Fig. 97.)

Products of the Soil. In the grassy steppe region of the Sudan, just south of the Sahara, date palms and cereals are grown. In Upper Guinea and the southern British Sudan, cotton, maize, and millet can be raised.

In the damp equatorial belt of the Congo Basin and on the eastern coast the products are all derived from the forests, chiefly from the cocoa and oil palms and the banana trees. The oil is exported for use in making soap, and bananas are the chief food of the people. South of the Congo, in the savanna regions, cotton, maize, and millet are produced, as in the similar region to the north. In German and British East Africa rubber, ivory,

and coffee are the chief products.

Development. The development of central Africa has been very slow. (See Figs. 490



FIG. 489. *Natives and their mud hut villages in Portuguese East Africa.*



FIG. 490. *The Congo River. Notice the dense forest and the canoe dug from a log.*



FIG. 491. *Dar-es-Salam, the Capital of German East Africa. Note its modern appearance.*

and 492.) Most of the countries have anything but a settled government and the slave trade is still carried on. The soil is not generally fertile, and the means of communication with the interior are poor. Navigation on the great rivers is interrupted by falls and rapids, which means that goods must oftentimes be unloaded, transferred around the rapids, and reloaded, so that the cost of carrying on commerce is excessive.

In the north, products are transported largely by caravans, which take three months to go from Sudan to Tripoli. (See Fig. 484.) On the east coast, owing to the absence of roads, goods are carried by human porters. Each porter will carry from fifty to a hundred pounds, and will cover from eighteen to twenty-two miles a day. Oxen cannot be used on account of the tsetse fly, whose bite is fatal to cattle. For these reasons central Africa is probably destined to remain backward in its development for some time to come.

Trade. Oil and oil seeds, ivory, and rubber are the chief exports of central Africa.

The amount of these products is constantly decreasing, however, owing to the reckless way in which the sources of supply are destroyed. This is especially true of ivory, as the elephants are killed faster than they can increase.

Lagos, in Nigeria, is one of the principal ports. It has a large trade in palm oil. *Loanda*, in Angola, is the second port in importance. *Lourenço Marques*, on the east coast, has the best harbor on the continent, and is connected by rail with the important towns of British South Africa.

Questions and Exercises

- (1) What has prevented the rapid opening up of the Congo region to European civilization and trade? (2) Compare the Congo and the Amazon, in location, climate, products, accessibility. (3) What modern substitute do we have for ivory? (4) Trace a caravan route from Sudan to Tripoli; from Timbuktu to the southern slopes of the Atlas. (5) Draw the chief rivers and locate important caravan and other routes. (6) Show the railroad connections between Lourenço Marques and towns in South Africa. (7) How many independent states are there in central Africa?



FIG. 492. *Negro warriors of Central Africa. Notice their hut behind them.*



FIG. 493. *A view of Delagoa Bay, Portuguese East Africa.*



FIG. 494. A Zulu kraal or village in the plateau region of South Africa.

LXVI. SOUTH AFRICA

Climate and Surface. South Africa includes *German Southwest Africa* and *British South Africa*, the northern portion of which really lies in the tropics. The climate of the extreme southern portion of Africa is temperate and in many ways like that of the United Kingdom. Hence Cape Colony, which has been settled by colonists from the United Kingdom, has developed rapidly, as have Australia and Canada. All of these countries have a climate so similar to the climate of the British Isles that the English people have found it easy to adapt themselves to the new conditions.

Throughout southern Africa the highlands extend close to the coast and rise abruptly, so that any moisture-bearing winds lose their moisture quickly and the interior receives little rainfall. (See Fig. 97.)

On the east the Kwathlamba Mountains (Drakenburg) rise close to the coast and slope down on the west to the interior plateaus, which lie at an altitude of about 2,000 feet. They cut off the moisture and the rains brought by the southeast trade

winds, and hence the tablelands of the interior are subject to drought.

In the western portion, lying in the lee of the mountains and plateaus, is the *Kalahari Desert*. In the southwest are tablelands from two to three thousand feet in altitude, rising above the sea in terraces, and known as the *Great* and the *Little Karroo*.

Products of the Soil. Along the eastern and southern coasts of South Africa agriculture is carried on. Cereals and fruits are the chief products. Some of the fruits are now brought to the United States. Sugar and tobacco are produced in the southeast, but are largely consumed at home.

Stock Raising. Ostriches are raised in the southeast in large numbers for the sake of their feathers. Grazing, however, is the most widespread industry. Sheep are the most important animals, especially in *The Transvaal* and *Orange River Colony*. Goats are raised in the harsher climate east of the Great Karroo. Cattle are important on the coast, in *The Transvaal*, and in *German Southwest Africa*, where the surface of the country and the climate favor grazing.



FIG. 495. The framework of a Zulu hut in South Africa.



FIG. 496. The Boer method of traveling across the veldt, as the rolling country of South Africa is called.



FIG. 497. *The market square at Johannesburg.*

Mineral Products. The Transvaal contains unusually rich deposits of gold which are very extensively worked. In fact this country ranks next to Australia and the United States in the production of gold. (See Fig. 498.)

Johannesburg, the chief town of The Transvaal, is the most important mining center. (See Fig. 497.)

Kimberley lies in the center of extensive diamond fields, and exports more than nine-tenths of the diamonds used in the world.

Trade. Owing to the regular form of the coast line of South Africa, good harbors are few, and even those that can be used are oftentimes so severely swept by winds during the time of the southeast trade winds that shipping is not safe. *Cape Town*, *Port Elizabeth*, and *Durban* have the best harbors. (See Fig. 481.) Owing to the abruptness with which the land rises, the railroads into the interior follow heavy grades, and the cost of transportation is great.

The commerce of South Africa is practically all with the United Kingdom. Gold is by far the most important export, and diamonds, wool, angora hair, and ostrich feathers are the other chief products in trade. Trade with the United States is unimportant.

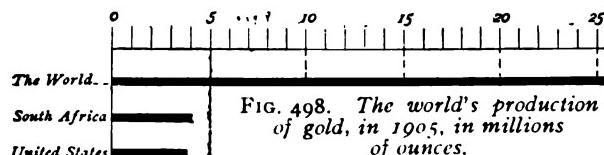


FIG. 498. *The world's production of gold, in 1905, in millions of ounces.*

Questions and Exercises

(1) What European nation first settled in South Africa? What names on the map recall this occupation? (2) What attracted the British to this region? (3) In which parts of the country are there rich mineral deposits? Locate two important mining towns. (4) Through what ports are these products sent to England? (5) Make a list of the countries composing British South Africa, and opposite each write the names of the chief towns.

(6) On an outline map of Africa color in red all the British possessions in Africa, in blue all the German possessions, in yellow all the French possessions. (7) What do you notice about the British possessions? (8) Why are these foreign nations so eager for control in Africa? (9) Why are the British so desirous of building a railroad from the Cape to Cairo?

(10) Tell how the surface of South Africa has influenced the distribution of vegetation; the means of communication. (11) Tell why the great lakes of Africa are of less commercial importance than the Great Lakes of the United States. (12) Show on a map of Africa the trade routes between the commercial countries of Europe and the Suez

Canal. (13) Show the ocean routes between Europe and the East before the construction of the Suez Canal. (14) In what way is South Africa like portions of Australia? (15) Why have British colonies developed rapidly in South Africa? (16) What season of the year is it at Cape Town now? (17) What products have you ever seen that came from South Africa?



FIG. 499. *Cutting sugar cane near Pretoria.*

LXVII. ISLANDS NEAR AFRICA

MADAGASCAR

Surface and Industry. *Madagascar*, a large island lying two hundred and fifty miles southeast of the coast of Africa, belongs to France. It is mountainous throughout, but is well watered and abundantly supplied with grass. Cattle raising is the most important industry. Gold, rubber, cattle, and raffia are the chief exports. The commerce, which is small, is centered at *Tamatave*, which is the only good port.



FIG. 500. A general view of Cape Town, South Africa, looking toward Table Mountain.

MAURITIUS AND RÉUNION

Ownership and Products. *Mauritius*, belonging to the United Kingdom, and *Réunion*, belonging to France, are two small islands east of Madagascar. They are both covered with tropical plantations producing a large amount of sugar. Sugar, therefore, forms the principal export; it is sent especially to India.

ISLANDS OF THE ATLANTIC

Ownership and Products. Of the several groups of islands on the west coast of Africa the *Azores*, the *Madeiras*, and the *Cape Verde Islands* belong to Portugal. The Azores raise oranges and pineapples, and the Madeiras produce wine and fruit. The Cape Verde Islands are of little importance except that the Island of St. Vincent is an important coaling station for Atlantic steamers. The *Canary Islands* belong to Spain, and produce

a great quantity of early vegetables for the London market.

Questions and Exercises

- (1) Why is Madagascar an oceanic rather than a continental island?
- (2) Why is it so well watered?
- (3) To what European ports do its products go?
- (4) What two islands are near Madagascar?
- (5) To what country do they belong?
- (6) What groups of islands lie west of Africa?
- (7) For what are they important?
- (8) To what countries do they belong?

SUMMARY

Africa is the second largest continent, but, owing to its unfavorable climate and the

difficulties encountered in travel, it is the least progressive and the least developed. Only the coastal areas of the more temperate regions are occupied by Europeans, and European influence has had but little effect throughout the continent. Its commerce is therefore not very important and amounts to only one-tenth of the commerce of the world. The most progressive regions are in the temperate areas of the south.

The rich tropical regions of central Africa are almost inaccessible and are separated from the ports on the northern coast, that are within easy reach of southern Europe, by a vast desert which is difficult to cross. The inhabitants are largely primitive people,

who live on the natural resources of the country and who contribute little to the world's commerce, except ivory, skins, gums, and other similar products.



FIG. 501. Native negroes of Madagascar standing in front of their hut.

ASIA

LXVIII. THE CONTINENT AS A WHOLE

Size and Position. The continent of Asia is more than twice the size of North America (see Fig. 28); it includes more than one-third the land of the world and more than one-half of the people. It lies entirely in the Northern Hemisphere, but its southern point extends to within ninety miles of the equator, and its northern coast lies half-way between the Arctic Circle and the Pole. (See Fig. 502.) Its most western point in Asia Minor is in the same longitude as Bukarest, and its most eastern extremity almost touches North America at Bering Strait.

The populous countries of Asia are separated from North America by the Pacific Ocean, and from the progressive nations of Europe by the great land mass lying between. (See Fig. 502.) Hence Asia has remained somewhat isolated commercially, and even now but few of its nations have any conspicuous part in the world's trade. The southeastern coast of Asia and the East Indies, however, have long been of interest to all the people of Europe because of their valuable products, which were sought by explorers in early times.

Coast Line. The coast of Asia is bordered by a great number of seas, bays, and gulfs, extending in an unbroken series from Bering Strait on the northeast to the Red Sea on the African boundary. (See Fig. 503.) These

seas, with their protected waters, have always favored the development of coastwise trade except in the north and northeast where the waters are frozen for many months in the year. There are several good harbors on the southern and southeastern coasts which are situated in a favorable climate and are of great commercial importance. The southern peninsulas are broad and fertile and have therefore favored the development of a large population, much larger and denser than can be accommodated in the smaller peninsulas of southern Europe.

The Great Northern Plain. Asia includes a larger area of plains than any other continent. The great northern plain, which extends from south of the Caspian Sea to Bering Strait, is a continuation of the plain of northern Europe. A large part of this great region lies less than six hundred feet above the level of the sea, and its surface

is but little broken by hills. As a result, there are no barriers to break the force of the winds which sweep across the plains with great force in winter.

The southwestern portion of this plain is, in part, below the level of the sea, and contains a broad area of interior drainage. Here we find several salt lakes and seas, which, from evaporation and other causes, have much decreased in size as compared with the past. They are now only shallow bodies of extremely salt water surrounded by gently sloping shores, the soil of which is full of salt.



FIG. 502. *The position of Asia among the continents.*

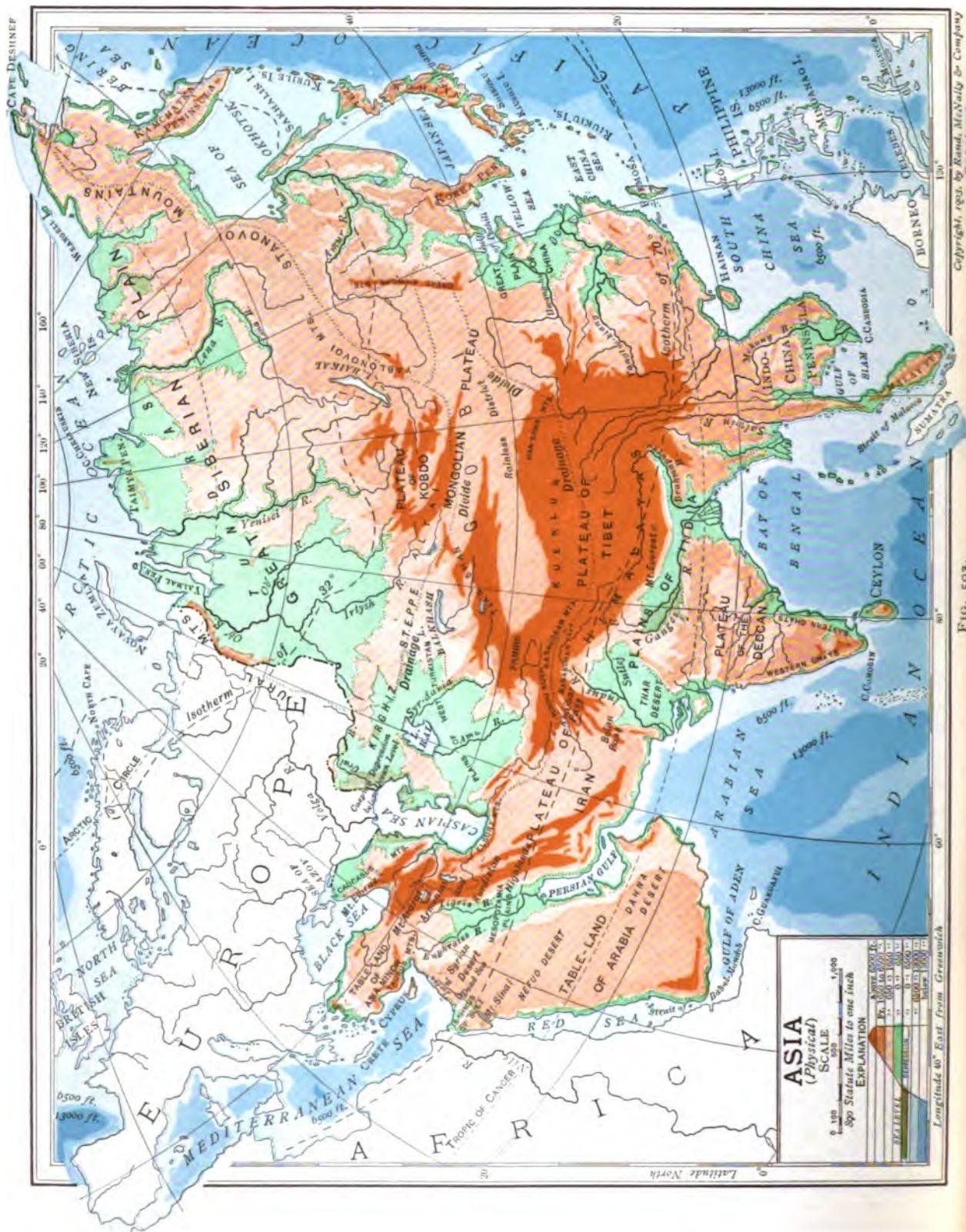


FIG. 503.

Rivers of the North. The great rivers of the plain, the *Ob-Irtysh*, the *Yenisei*, and the *Lena*, flow northward. Their headwaters, thawing out in the spring before their lower courses have melted at all, pour down an enormous volume of water which floods the country and does great damage. In the middle of the summer these rivers are navigable for several hundred miles, but in winter they are frozen to a great depth.

The Great Central Highland. The greater part of southern Asia consists of a great highland and plateau area, which includes the loftiest peaks of the world. The great mountain ranges which form this highland radiate in all directions from the *Pamirs*, or "roof of the world," as they are often called, which lie in southern Turkistan. The *Hindu Kush* and the *Elburz* mountains extend to the west. The *Tian Shan*, to the east and northeast, are the beginning of the continental divide which separates the long north and west flowing rivers from the shorter streams which flow toward the south and east. This divide includes the *Altai*, *Yablonovoi*, and *Stanovoi* mountains.

South of this divide and east of the *Pamirs* lies the great interior plateau of the *Desert of Gobi* and the higher plateau of *Tibet*, the latter with an average elevation of more than fifteen thousand feet. This plateau area is bounded on the south, as on the north, by high mountains exceedingly difficult of passage, of which the most important ranges are the *Himálayas*, the highest mountains of the world. (See Fig. 503.) *Mount Everest* in the *Himálayas*, with an altitude of more than five miles, is the loftiest peak in the world and

is surrounded by many others nearly as high. Irregular mountain ranges, some of them of considerable altitude, extend out to the east and southeast of the Plateau of *Tibet*, so that the larger part of eastern and southeastern Asia is mountainous. (See Fig. 504.)

In all this great highland area there is only one low pass and easy line of communication between northern and southern Asia. This lies between the *Hindu Kush* and the *Elburz* mountains. It therefore forms an important highway of commerce between Asia and Europe.

Rivers of the South and East. The great rivers of southern and southeastern Asia rise

within the mountain ranges, some of them in the Plateau of *Tibet*, and break through these great barriers in narrow gorges, which are often difficult of passage. The most important are the *Hwang-ho* and the *Yangtse-kiang* in China, and the *Ganges-Brahmaputra* and the *Indus* in India. Each of these great



FIG. 504. In the mountainous region of the *Himálayas* in *Tibet*.

streams is navigable for long distances in its lower course and is hence of great importance to the country through which it flows. At certain seasons these streams are crowded with small and large boats engaged in commerce between the coast towns and the interior. The *Ganges* and the *Brahmaputra*, which merge at the head of their delta, drain different portions of the great plain of India. The *Brahmaputra* and the *Indus* form natural highways through the great *Himálayan* range, and are therefore of vast importance to *Tibet*. (See Fig. 511.)

These rivers, as they flow out toward the sea, carry with them an enormous quantity of detritus which they have removed from near their headwaters. This detritus has been

deposited along their courses for centuries, until the rivers have built up great alluvial plains with gentle slopes and fine, well-watered soil.

With the exception of the *Amur*, which flows to the northeast into a sea frozen in winter, and the *Tigris* and *Euphrates*, which lie in an equally unfavorable dry region, all these river valleys are areas of dense population. They are the seats of some of the oldest civilizations in the world.

The Tablelands of the South. The two great southern peninsulas of Asia, *India* and *Arabia* are high table-lands, and each is separated by a low river valley from the main mass of the continent to the north. (See Fig. 503.)

The peninsula of lower India, known as *The Deccan*, is highest to the west, where the tableland rises in mountain-like peaks known as the *Western Ghats*. (See Fig. 503.)

The long rivers, therefore, flow to the east toward the Bay of Bengal. The table-land on this side is low and faces the ocean in a ridge, known as the *Eastern Ghats*.

The table-land of Arabia, forming the greatest peninsula in the world, is high in the south and lower in the north. Lying in the heart of a great desert region, it has no rivers and is of little commercial importance. Therefore it is strikingly contrasted with the somewhat smaller peninsulas of India and Indo-China which lie in a climate favorable for dense occupation.

The Islands. Bordering Asia on the east and south is a great series of islands. Many of them are of volcanic origin, and some still contain active volcanoes. They are a part

of the great volcanic rim that surrounds the Pacific Ocean. (See Fig. 69.) From Yezo southward the islands are populous and, with the introduction of European and American methods, are increasing in importance commercially.

Climate. The continent of Asia, owing to its size, has the most strongly marked continental climate in the world. Because of its great extent in latitude, the temperature ranges from the most extreme cold in the north to the excessive heat of the tropics. (See Fig. 74.) There is also a great variation in temperature in the highland areas, according to the elevation. The peaks of the *Himálayas* rise far above the snow line, while their foothills are covered with tropical vegetation.

The great plains and plateaus of the interior of Asia are centers from which strong winter winds blow outward, carrying cold



FIG. 505. Transportation in the cold regions of central Asia.

toward the oceans. (See Fig. 82.) They are therefore very cold and dry at that season. Near the little town of Verkhoyansk in northeastern Siberia the average January temperature is 60 degrees below zero, and temperatures more than 90 degrees below zero have been recorded. This region is the coldest known place in the world, and is called the *Cold Pole*.

In summer, when the great interior region is warmed by the strong rays of the sun which penetrate the dry air, the temperature rises so that the average July temperature in places in the northern plain is more than 95 degrees Fahrenheit. (See Fig. 84.) The summer winds, blowing from the cooler ocean toward the land, are for that reason damper than those of winter, so that in summer the

interior of the continent gets a little more moisture than in winter.

On the southeast and southern coasts the winds change with the season, and are therefore *monsoons*. In summer the southeast and southwest trade winds, blowing in toward the Heat Equator, which at that time has advanced to its most extreme northern position, carry an abundance of moisture toward the interior plains of the south. At this season the climate of the southern lowlands is exceedingly disagreeable for white people and therefore the residents of the cities move to the higher hills, if possible. As the air rises it cools rapidly and excessive rainfall ensues. (See Fig. 97.) The town of *Cherra Punji*, in the southern foothills of the Himalayas, is so peculiarly situated that it has an average annual rainfall of over four hundred and ninety inches, or more than forty feet, the greatest rainfall known in the world. An amount of precipitation nearly as great as the average *annual* rainfall of New York City, which is over forty-four inches, has been known to fall in *Cherra Punji* in one day.

During the winter the southern and southeastern coastal areas are swept by the fair, cooling northerly trade winds, and therefore have an agreeable climate at that season.

Vegetation. The distribution of vegetation follows closely the distribution of heat and moisture. Along the northern coast is the great *tundra* belt, covered with mosses and lichens and with low bushes which bear berries during the brief summer season. On the south the tundra area merges into the evergreen forests with their larches and firs, the great hunting ground of northern Asia.

(See Fig. 119.) South of the forest area is an arable region in which agriculture is now beginning to be carried on. (See Fig. 511.)

The lowland area around the Caspian Sea and Lake of Aral is a *steppe*, extending as far east as the river *Ob*. Along the coast of the Mediterranean the vegetation is similar to that in the Mediterranean region of Europe; that is, it is subtropical in its character.

The high mountains are everywhere snow-covered. The great interior plateaus of Gobi and Tibet and the tablelands of Arabia are, because of their position, part of the great desert region of the world, which extends across Africa and Asia from the Atlantic Ocean to the Pacific.

The lowland plains of southern and southeastern Asia are swept by monsoons and have an abundance of vegetation of a tropical and subtropical nature, owing to the warmth, moisture, and sunshine

which abound there. In the extreme southern portion, where the conditions are tropical, jungles nearly as dense as the tropical forests of Africa and South America exist. (See Fig. 119.) The tableland of The Deccan is a great *savanna* area in which agriculture flourishes.

Animals. The animals of northern Asia are similar to those of northern Europe, because there is no mountain barrier to prevent the animals from wandering readily over the great plain area of these two continents. The animals of southeastern Asia are separated from the animals of the north by the great highland barrier over which they cannot readily migrate. They must therefore be grouped by themselves to form the animal realm known as the Oriental Region.



FIG. 506. In the hunting ground of northern Asia where forests of fir abound.

The most important wild animals of the northern tundra and forests are the reindeer, which has been domesticated, and the fur-bearing animals, which yield a large portion of the furs of the world. Throughout this area, wherever occupied, and in southeastern Asia, horses, asses, and cattle have been introduced; camels, sheep, and goats are found in great numbers in the steppe regions.

The yak has been domesticated and is extensively used as a beast of burden in the highlands of Tibet. The buffalo and the elephant have been domesticated in India, and are the only animals of the Oriental Region that are of any special value to man. (See Fig. 507.)

People. More than five-sixths of the vast population of Asia are found in the monsoon area, particularly in India and China. The favorable climate and the abundant vegetation in these regions enable large numbers of people to secure

the necessities of life from a small territory.

The areas swept by monsoons are the most densely inhabited regions of the world, with the exception of small districts in certain large cities. The plains and highlands of Asia are the least thickly inhabited of almost any regions in the world.

Three-fourths of the people of Asia belong to the yellow race, and the remainder to the white race. The white race includes the Jews, Syrians, Arabs, Hindus, and Persians. With the exception of the Europeans who have come into Siberia in recent years, the white race is mostly found in the southwest and south. The yellow people are extremely varied in their characteristics and in their language. Taken as a whole they are backward in their

development. The people of Japan are active, enterprising, and progressive, but their kindred of the yellow race in northern Siberia are extremely unprogressive. Nations like the Chinese, who reverence the old and dislike the new, who are conservative and self-satisfied, and have merely tolerated the presence of Europeans, have not profited from their contact with modern civilization. Other countries, like Japan, in which European customs have been adopted, or in which foreigners have been welcomed with a view to improving methods of production and trade, have made rapid advances in recent years.

The same is true of India and other countries to which European colonists have gone in large numbers.



FIG. 507. An elephant taking up a teak log in the lumbering district of Indo-China.

tude of Canton and Vladivostok. (3) What towns in North America are in approximately the same latitude?

(4) Write the name of a port on each indentation; the name of the chief town on each large island. (5) When it is noon at Tokio what time is it at Khiva? (6) Draw the meridians of these towns and write the time at each place. (7) Write in two columns the harbors of the south and east coasts.

(8) Take a sheet of paper the size of the map of Asia and draw a triangle or whatever form best represents to you the general shape of the highland region of Asia. (9) Color this a light brown and draw as accurately as you can the courses of the great streams which radiate from this highland. (10) Write the names of the rivers and draw the Arctic Circle and the Tropic of Cancer on this diagram. (11) Make a list of the rivers, grouping them according as they empty into the Arctic, Pacific, or Indian ocean. (12) Which do not reach the sea?

Questions and Exercises

(1) On an outline map of Asia, write the names of the surrounding oceans and their arms; also the names of the continental islands.

(2) On the right-hand margin of the map write the approximate lati-

tude of Canton and Vladivostok. (3) What towns in North America are in approximately the same latitude?

(4) Write the name of a port on each indentation; the name of the chief town on each large island. (5) When it is noon at Tokio what time is it at Khiva? (6) Draw the meridians of these towns and write the time at each place. (7) Write in two columns the harbors of the south and east coasts.

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(13) Which great mountain ranges are crossed by rivers? (14) Which form divides? (15) Which rivers are building large flood plains? (16) How has this fact affected settlement? (17) What are the difficulties in passing from the coast into the interior by water? (18) What two rivers of China help to open up the interior to settlement? (See Fig. 503.) (19) What river valleys separate each of the southern peninsulas of Asia from the main continent? (20) Why is Arabia of less importance than India?

(21) On an outline map locate Yakutsk, Irkutsk, Khiva, Tokyo, Vladivostok, Peking, Calcutta, Singapore, and Jerusalem. (22) Write the January temperatures in one column and the July temperatures in another. (23) Which city has the greatest range of temperature? The least? (24) Why is Peking warmer than Tokyo in summer? Compare their winter temperatures. Explain. (25) Why is Lisbon cooler in summer than Peking? (26) Draw the January isotherms for zero degrees and forty degrees in one color and the July isotherms of fifty degrees and eighty degrees in another. (27) Describe the winter climate of Peking.



FIG. 508. A village on the Amur River, Siberia. This region has long, severe winters and short, hot summers.

LXIX. RUSSIA IN ASIA

SIBERIA

Area and Population. The Asiatic portion of the Russian Empire which includes *Siberia*, *Turkistan*, and *Caucasia*, has an area greater than that of all Europe, but a population less than that of Belgium. The population is, in part, composed of peasants and of criminals who have been deported from Russia. The larger portion of the people is found in the western part of the country, especially in the valley of the Ob-Irtysh River. The population is increasing in the valleys of the other larger rivers and along the line of the Trans-Siberian Railroad. (See Fig. 169.)

Surface. West of the Yenisei River, Siberia is flat and marshy, contains many lakes, and

has a deep, rich soil. The divide between the Ob-Irtysh and the Yenisei is almost imperceptible. East of the Yenisei the country is stony and rolling, with frequent exposures of the underlying rocks. The northeast has a varied surface; the country is rolling and in many cases extremely rough.

Climate. The winters of Siberia are long, extremely cold, and very dry; the severity of the winter increases from the west to the northeast. (See Fig. 82.) The summers are short and hot, with sufficient moisture for successful agriculture in the west-central portion. The spring comes on very suddenly; oftentimes

not more than two weeks of spring weather intervene between the cold of winter and the hot summer with its abundant vegetation.

Western Siberia has a climate similar to that of northwestern Canada, though on the whole more favorable for agriculture. The

rainfall is so slight that large areas of the country are often subjected to drought. The crops then fail and destitution follows.

Products of the Soil. The chief agricultural products of Siberia are wheat, rye, and oats, which are particularly adapted to cool climates where the summers are short. Owing to the ignorance of the farmers agriculture has been extremely backward for a long time, but now it is rapidly improving. The farmers are learning to make use of modern agricultural implements, and the new Trans-Siberian Railroad is giving an outlet for the products. At present agriculture is carried on in the steppe region as far as 62 degrees north latitude. (See Fig. 511.)

So far as timber products are concerned, the immense forests of Siberia are not of any particular commercial value on account

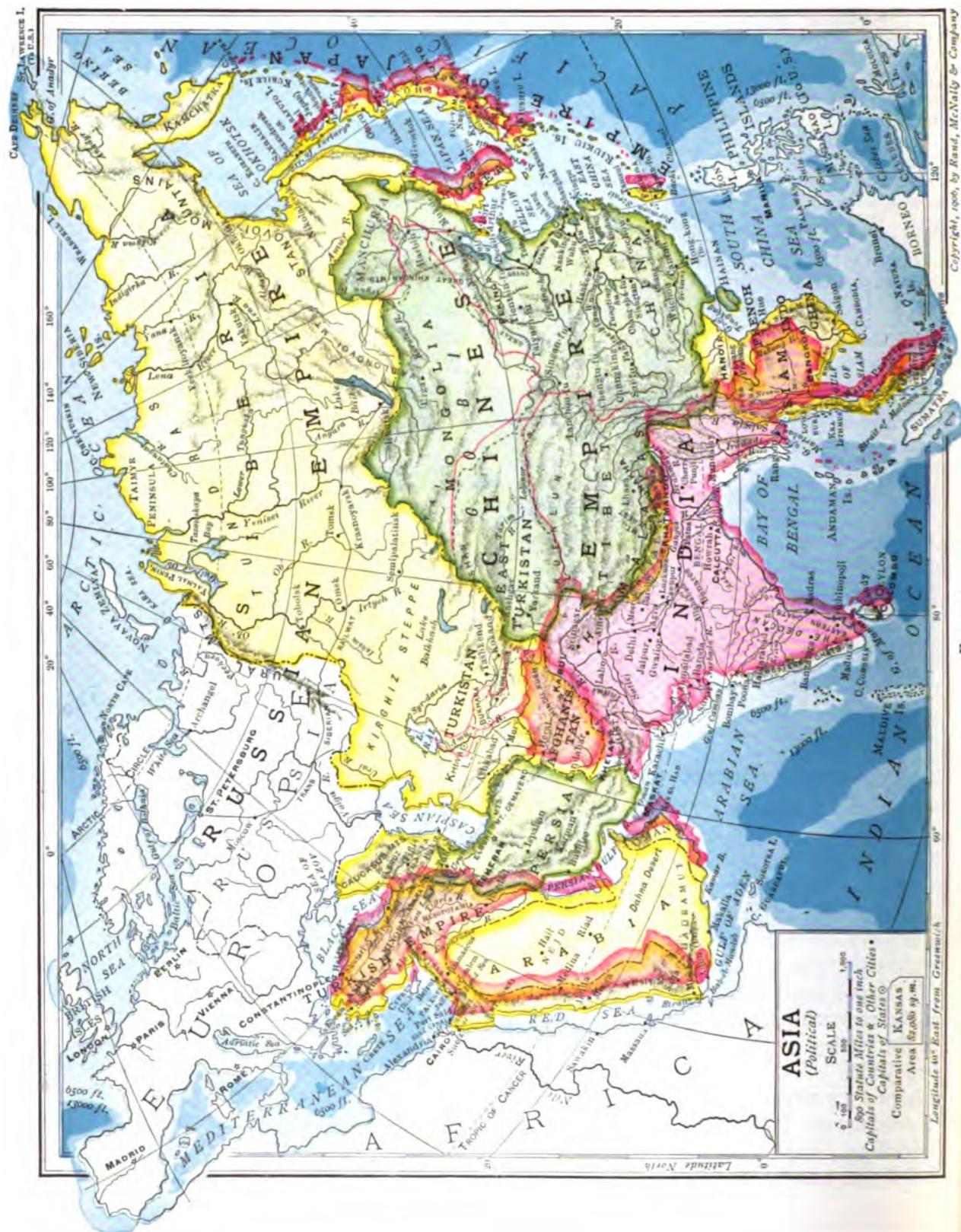


FIG. 509.

of the lack of transportation facilities. The forests are of great importance, however, because of the furs sent from them to the leading fur markets of the world, and especially to Leipzig. (See Fig. 511.)

The only product of the tundra area which is of any commercial importance is the ivory secured from the buried remains of the great hairy mammoth which formerly lived in this region. The supply, however, is being rapidly exhausted, so that the tundra gives no promise of furnishing valuable products indefinitely. (See Fig. 511.)

Mineral Products.

Mineral products in some abundance are found scattered through the country. The most important are gold and silver. Gold is found in the river gravels and silver is secured from the Altai Mountains. (See Fig. 511.)

Coal, iron, lead, and copper are also found, but the coal is poor, and none of these mineral products has been developed so as to be of any considerable commercial value.

Trade. Siberia is unfavorably situated for carrying on trade. It has no open harbors except in the summer; it has no canals, few good roads, and only one great railroad; its navigable rivers are icebound the greater part of the year.

The Trans-Siberian Railway, which was finished in 1902, connects Russia in Europe with Vladivostok on the Japan Sea, giving Siberia and Russia access to the Pacific Ocean. (See Fig. 511.) The distance by rail from St. Petersburg to Vladivostok is about 5,633 miles. Passenger trains cover the distance in about two weeks; freight trains require a

longer time. More than one-half the freight carried over this road is grain; the rest is largely animal products and tea. Tea is transported over the land westward from Asia to Europe because it has been found that "overland" tea is superior to tea carried by water. During a sea voyage tea absorbs moisture and loses its flavor.

The only towns of any considerable size in Siberia are *Tomsk* and *Irkutsk*, both of which have a population of more than fifty thousand and are centers for the local government.



FIG. 510. Vladivostok, the terminus of the great Trans-Siberian Railway.

TURKISTAN

Situation and Surface. Turkistan lies to the west of China and north of India, Afghanistan, and Persia. Its surface, consisting of plains in eastern Turkistan and of high plateaus in the Pamirs, is very rugged. Most of the country, owing to its position, is either a desert or a steppe. The population therefore is extremely scanty, and the chief occupation is grazing.

Products; Cities. The products of Turkistan are of no particular importance. Millet, maize, rice, and flax are raised in the irrigated section, largely for home consumption, and some cotton is raised for export.

The only towns of any size are irrigated



Fig. 514.

oases like *Merv*, *Khiva*, *Bukhara*, *Samarkand*, and *Tashkend*. These centers are connected by a railroad; it is the only one in this portion of the country, and is therefore of considerable importance. In time of war or of threatened trouble, Russia could quickly transport a large force to the Afghanistan frontier of India by means of this railroad.

CAUCASIA

Situation and Surface. Caucasia includes land on both sides of the Caucasus Mountains. It is a country of mountains and tablelands, with rich valleys lying between.

Products. The climate and soil of the valleys favor grapes, corn, and cotton.

Petroleum and manganese are found in large quantities, and are the chief natural resources of the region. In fact, Caucasia furnishes more than one-third of the world's supply of petroleum. (See Figs. 511 and 513.)

Cities. *Tiflis* is the principal town, but *Baku*, in the Caspian petroleum field, is rapidly pushing to the front on account of the development of the oil industry. Both cities are situated in the great valley between the two chief ranges of the Caucasus Mountains. From the earliest

times this valley has been the great highway of commerce between the Caspian Sea and the Black Sea. It is now traversed by a railroad which connects at Baku with another line extending from central Russia round the eastern end of the mountain system. (See Fig. 511.)



FIG. 512. *Breaking rice in southern Turkistan.*

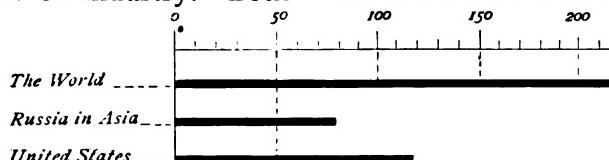


FIG. 513. *The World's production of petroleum in 1904, in millions of barrels.*

Questions and Exercises

- (1) On an outline map write the chief products of Siberia. (2) Draw the Trans-Siberian Railway and locate chief towns on the road.
- (3) Write the names of the chief products carried by the road. (4) Tell something which you have read at home about life in Siberia.
- (5) Locate the railroad which connects Baku with Tashkend and name the cities on the line.
- (6) Of what importance to Russia is this road?

- (7) How does oil from Baku reach St. Petersburg? (8) Where are the irrigated portions of Turkistan? The grazing regions? (9) Why are Lake Aral and the Caspian Sea salt? (10) Mention features of this region similar to those of the Great Basin in North America. (11) Why do the streams flowing into Lake Aral come from the east? (12) What time is it at Khiva when it is noon at Greenwich? (13) Compare the latitude of Khiva with that of Salt Lake City, Utah.

LXX. ASIATIC TURKEY

Surface and Climate. Asiatic Turkey includes *Asia Minor*, *Syria* and *Palestine*, *Mesopotamia*, and extensive strips of coast in Arabia. A large part of the country is a tableland three thousand feet high. The only

lowland of importance is the valley of the *Tigris-Euphrates*, forming what is known as Mesopotamia. Owing to the location, there is a scanty rainfall throughout the region except on the hill slopes facing the sea. The air is clear and dry, hence the daily and the annual range of temperature is great. The desert-like character of the country confines the people to pastoral occupations except in the irrigated regions.

ASIA MINOR

Products. Asia Minor is mostly arid, but along the coast, where irrigation is carried on, crops peculiar to the shores of the Mediterranean are raised. The character of these is indicated by the exports from *Smyrna*, the chief town. These exports, in the order of their commercial value, are raisins, cotton, opium, figs, barley, licorice, carpets, wool, and sponges.

Sponges are secured from the Aegean Sea, and the wool is mainly from the Angora goats. Oranges, which thrive in similar latitudes elsewhere, are not produced here in any quantity, owing to the severity of the winters.

Transportation and Trade. Asia Minor has but few good highways, although it contains the remains of many fine old roads built in the time of the Romans. Railroads are now being built, and in the course of time there will probably be a complete line from Haidar Pasha, opposite Constantinople, to the Persian Gulf. This railroad will undoubtedly be of great strategic and commercial importance when the country along its route is developed and becomes so rich that the great nations will join in its protection, as they have joined in the protection of China.

At the present time most of the interior transportation is carried on by means of horses and cattle. *Trebizond*, a port of increasing importance on the Black Sea, is



FIG. 514. A typical walled city in Asia Minor.

the terminus of an important caravan route through Mesopotamia and northern Persia.

SYRIA AND PALESTINE

Surface and Climate. Syria is a country of great historic and religious interest. It consists of a narrow coastal plain, somewhat wider to the south than to the north, and bordered on the east by two abrupt ranges of mountains. These mountains are covered with forests, and between them lies the wonderful depression containing the *Jordan River* and the *Dead Sea*.

The Dead Sea is 1,290 feet below sea level and its waters are very salt. The climate of this depression is warm and dry, indeed almost tropical in summer.

East of the mountain ranges is a high plateau which extends into Arabia. With the



FIG. 515. A general view of Bethany.

exception of the irrigated portions and the fertile plains of the Mediterranean coast, Syria is generally dry. (See Fig. 97.) On the great plateaus of eastern Syria grazing is carried on, not only as extensively, but in practically the same way as in the time of Christ.

Products. The chief products of Syria are silk, tobacco, and oranges. Soap-making is a local industry in certain regions. The soap oil is made from olives, and the soda required in the process comes from certain plants which grow in the salty soil.

Cities. *Beirut*, which is connected by rail with *Damascus*, is the chief port of Syria.

Damascus produces cloth, leather, and inlaid work, which have been noted for their fine quality for centuries. It is important historically and is the terminus of caravan routes from Arabia and the East.

Jaffa is the port of *Jerusalem*, and is connected with that ancient city by a railroad. The whole country is of great interest to all who profess the Christian, Jewish, or Mohammedan religions, and Jerusalem in particular is a holy city to all these sects.

ARABIA

Surface and Climate. The great desert table-land of Arabia receives rain only in the southwest in the province of Yemen, and in the southeast in the independent state of Oman. These two places have a limited rainfall in spring and autumn, and certain crops can be grown, of which the leading ones are coffee, subtropical fruits, and vegetables.

Products; Cities. The interior of Arabia is of some importance because of the horses, camels, and dates which are produced there. Arabian horses are known the world over for their beauty and intelligence.



FIG. 516. *Damascus. A stopping place for pilgrims, on the way to Mecca.*

The principal city of Arabia is *Mecca*, near the west coast. Mecca is the birth-place of Mohammed and the holy city to all Mohammedans, every one of whom during his life must make at least one pilgrimage to the sacred temple there.

In the extreme southwest of Arabia on the Gulf of Aden is the British port of *Aden*, which controls the narrow and important southern approach to the Red Sea. (See Figs. 511 and 517.) It is one of the strategic points guarding the United Kingdom's sea route to India. The fortifications at Aden are built in an extinct volcanic crater, the rim of which is more than 1,700 feet above the sea. The country roundabout does not produce sufficient food for the garrison and furnishes no firewood, so that both these necessities have to be imported. Water for drinking is secured by distilling the sea water.



FIG. 517. *The harbor and native city of Aden, with a group of natives in characteristic posture.*

MESOPOTAMIA

Soil and Climate. Owing to the general use of irrigation, the low-lying plain of Mesopotamia was formerly very rich, but the government of this region, like that of most of Asia Minor, has been so poor that the prosperity of the

country has been allowed to decline. The climate is so very hot that in summer the people live in underground chambers, which are much cooler than houses would be.

Products; Cities. The only products for export are cereals, dates, wool, gum, and hides. Mules and camels are raised in great numbers. Many of the products of subtropical countries which might be produced at home are imported. Inland communication is carried on by means of camels and river boats.

Bagdad, at the head of navigation on the Tigris, is the chief town, but is not so important as it formerly was. It is on the line of the proposed railroad to the Persian Gulf, and will recover its lost position when that road is built.

Questions and Exercises

(1) Where are the lowlands of Asiatic Turkey? (2) Which is below sea level? (3) Point out the mountain slopes which receive the most rain. (4) What kind of a coast line has Asia Minor? Syria? Arabia? (5) Which is best situated for carrying on commerce? (6) What mountain peak in the northern part of Asia Minor? In the peninsula of Suez? (7) For what is the latter famous? (8) To what country does it belong?

(9) Write the following cities in one column, their location in a second, and in a third some fact, either geographical or historical: Smyrna, Jerusalem, Damascus, Mecca, Bagdad. (10) What river in Asia Minor has given us a name, now applied to all similar streams? (11) Why is the possession of Aden important to the United Kingdom? (12) What other fortress does the United Kingdom control on the same great trade route? (13) Mention as many reasons as you can why Asia Minor and Syria are unprogressive.



FIG. 518. A group of Bedouins, or nomadic Arabians.

LXXI. PERSIA, AFGHANISTAN, AND BALUCHISTAN

PERSIA

Surface and Climate. Persia, a country as large as France, England, and Germany, occupies the *Plateau of Iran*. Owing to its position and surface, it is very dry, except on the mountains, where some rain and snow fall in winter.

Products and Trade. In the valleys and along the Caspian Sea, the only fertile regions cereals and fruits are grown. Products of

value in addition to these are carpets, rugs, and shawls made from the wool of the mountain sheep and goats, and brass work. These products, together with opium, raw silk, cotton, and horses, are sent in trade to Europe, and especially to Russia

Commerce is

carried on by boats over the Caspian Sea and by caravan to Trebizon. The leading imports are calico and cotton cloth—the characteristic imports of hot regions in which manufacturing is not well developed and which therefore are dependent upon other more favored countries for many of the necessities of life.

AFGHANISTAN AND BALUCHISTAN

Surface and Climate. Afghanistan is a mountainous country, rising above the Plateau of Iran and extending to the great highlands of the Pamirs. Owing to its altitude and location, the climate, like that of the rest of western Asia, is dry. In the lower valleys, however, some agriculture is carried on.

Baluchistan is an arid, unproductive region under the control of the British government. It is mostly made up of tablelands.

Products and Trade. Where the climate is favorable, as it is in the valleys, cereals, apples, and the vine are grown. Cattle, goats, and camels are raised in the colder, higher altitudes. The only trade route of any significance is from *Herat* to the Caspian Sea, although the caravan route through the *Khaibar Pass* is of some importance on account of the overland trade with India.

Questions and Exercises

- (1) Why do Persia, Afghanistan, and Baluchistan receive so little rain? (2) What influence does the mountain rim around the Iran Plateau have upon its rainfall? (3) Trace the trade route from Trebizond to India. (4) Why is this route important? (5) To what European country would its possession be of immense advantage? (6) For what products is Persia best known in America?

LXXII. INDIA

Position and Population. The Empire of India, one of the most important colonies of the British Empire, occupies the great peninsula of southern Asia and extends on the north to the Himálayas. It is nearly one-half as large as Europe, and contains approximately one-fifth of the people of the world. Its population is mostly made up of the white race, either Hindus or Europeans, but the English language is spoken by very few except those who have come from Europe. The Hindus

are divided among many races, and speak more than a hundred different languages.

Surface and Drainage. India is bounded on the northwest, north, and northeast by tablelands or very high mountains. (See Fig. 503.) The peninsula portion is a plateau, or tableland, varying in altitude from 2,500 to 1,500 feet, with a narrow coastal plain bordering the Eastern Ghats.

The tableland is separated from the foothills of the high mountains of northern India by the great plain occupied by the *Indus* and

the Ganges-Brahmaputra. This plain is from 150 to 300 miles wide, and contains the densest population and the most important commercial districts of southern Asia.

Coast Line.

The coast line of India is very regular, and consequently

permits of few good harbors except for a distance up the rivers or behind a sheltering barrier of islands, as at Bombay. The southern portion of the western coast is bordered by barrier beaches and lagoons which are of great importance in commerce for the protection they offer to vessels during the season when the southwest monsoon causes high breakers on the shore.

Climate. The climate of India is that always found in a district swept by monsoons. In winter from November to February, when the northern trade winds blow, the climate is dry and cool. In the rainy season, lasting from June to October, when the southern trade winds prevail, the climate



FIG. 519. *A group of dancing Dervishes in Persia.*

is warm and extremely wet. Before the beginning of the rainy season, and yet after the influence of the spring sun has begun to be felt, from March to May, the climate is hot.

The rainfall is heaviest in the *Western Ghats*, on the Khasi hills and the hills of *Upper Burma*, and in the delta of the *Ganges*. The rain in the rainy season comes in bursts; an enormous downpour often falls in but a few minutes. In the moist, warm region of the lower *Ganges*, where the favorable climate permits

northeasterly trade winds, crossing the Bay of Bengal, carry moisture to the land.

Canals and Irrigation. Throughout India, except in the lower *Ganges* and in the upper stretches of the rivers of The Deccan, extensive canals have been built to carry water from the rivers to the land where it may be used for irrigation. In 1901 there were more than 42,000 miles of these canals in India, many of which are also important as routes of trade. On The Deccan and in the plains

about Madras the rain of the rainy season is caught in tanks which have been built in the ground, and is used for irrigation during the dry season.

Vegetation. Every form of vegetation, from the desert flora of the northwest to the tropical jungle growth of the extreme southeast, is found in India. (See Fig. 119.) The plains are practically without trees, but they



FIG. 520. A town near Jaipur, India. It shows the mountainous region of the high plateau. a rapid growth of vegetation, the population is more than four hundred to the square mile; that is, as dense as is the population in Rhode Island, the most densely populated state in the Union.

The valley of the Indus is almost rainless, owing to the fact that the southwestern trade winds have passed over so small an area of water that they have not become sufficiently saturated to produce rain when they strike the warm lowland. When the rainfall is deficient in this region, crops fail and famine ensues. The rainfall in the Eastern Ghats is about a third or a fourth of that of northern India, and comes in the cool season when the

support a heavy vegetation. In the foothills of the Himálayas are forests of oak which merge into rhododendron thickets in the higher altitudes. On the still higher slopes are immense coniferous forests, while above 19,000 feet glaciers and permanent snow prevail. The principal lumber product of value is the teakwood, a very hard and durable timber found in the forests of The Deccan. (See Fig. 511.)

Products of the Soil. Owing to the favorable climatic conditions, and to the richness of the soil in the great plains and on The Deccan, agriculture is the leading occupation of the people of India. (See Fig. 511.) In



FIG. 521. A road cut through a banyan tree along the Ganges River, India, showing the luxuriant vegetation.

the irrigated regions two crops a year are harvested, one in October and one between January and March. Northwestern India, which has a winter climate as cool as southern Europe in summer, raises wheat and barley. Most of the crop is consumed at home, though some of it is exported at times.

The most important crops of India are rice, wheat, millets, and other cereals, and oil seeds, like linseed, castor beans, and mustard, and tobacco, and jute. Opium is produced abundantly in central India, and cotton is raised on the black lava soil of The Deccan. In the flooded lowland districts rice is the leading crop; it forms the principal food of the people of that region, so that but little of it is exported. (See Fig. 511.) Tea is one of the principal crops of the foothills of the Himalayas and of southwestern India, and indigo is raised in the Ganges valley and in the eastern lowlands. (See Fig. 511.)

Minerals. India is rich in minerals, especially coal, iron, copper, and gold, but the

coal is poor and the smelting of iron is therefore costly. Hence the minerals are but little worked. Salt is produced by evaporating the water of the lakes of the interior regions of the west; it also occurs in the form of rock salt in northwestern India.

Manufacturing. India was formerly famous for the weaving of fine silks, muslins, shawls, carpets, and rugs, also for its ivory, gold, silver, and copper articles. These goods are still produced, but owing to the introduction of modern machinery and cheap dyes, and to certain other conditions, the quality is not so

good as it once was.

The only manufactures of any importance are cotton, paper, and jute. Bengal and Bombay are the manufacturing localities.

Trade; Cities. India has an immense trade, especially with the United Kingdom, its sovereign country. Its total trade is more than a third of that of the whole continent. The chief

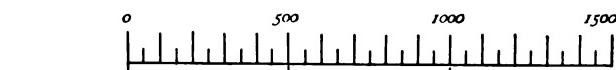


FIG. 522. The world's production of tea, in 1902, in millions of pounds.

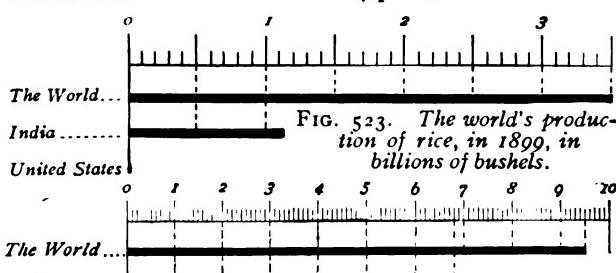


FIG. 523. The world's production of rice, in 1899, in billions of bushels.



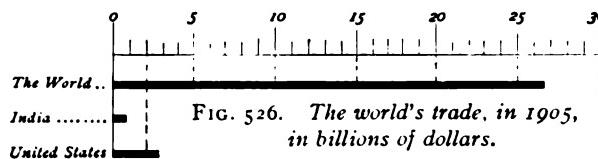
FIG. 524. The world's production of cotton, in 1905, in billions of pounds.



FIG. 525. A famous Indian tank, the waters of which are supposed to cure all diseases. The picture shows a religious ceremony.

exports to the United Kingdom are tea, wheat, jute, oil seeds, rice, cotton, and indigo. Opium is sent to China. The imports are largely provisions and manufactured goods, such as cottons, yarns, and machinery. Foreign trade is centered chiefly at Calcutta, Bombay, Madras, and Karachi.

Calcutta, on the Ganges, is situated lower down the stream than the earlier ports which



cannot be used by large vessels during the southwest monsoon. It has ready access to the wheat-producing country, and hence has an important trade.

Madras, also with an artificial harbor, lies in the midst of the rich plains of lower India, and is the fourth in rank among the ports of that country.

Of the interior towns, *Srinagar*, in the beautiful valley of Kashmir, is the most important. Through this town pass the shawls, wool, borax, and precious metals of the northwestern province, destined for India. It also has considerable trade with Eastern Turkistan, which is carried on by caravans over the *Karakoram Pass* at an altitude of 18,500 feet, the highest pass in the world occupied as a trade route.



FIG. 527. *The harbor of Calcutta. The foreign steamers are being loaded from the small native boats clustered in the foreground.*

sprang up on this river, owing to the filling up of the lower channel. The harbor is kept open only by costly engineering works. Calcutta, the chief trade center for the products of the Ganges, is the seat of the Indian government. (See Fig. 527.)

Bombay, with a fine protected harbor, is situated on an island off the west coast of India. (See Fig. 509.) Owing to the recent development of the railroads over the mountains, it has been brought into close touch with the producing areas of central India, and now rivals Calcutta in the importance of its trade.

Karachi has an artificial harbor which

NEPAL AND BHUTAN

On the southern slopes of the *Himálaya Mountains* are the two small independent principalities, *Nepal* and *Bhutan*.

Questions and Exercises

- (1) Draw a sketch map of India and write the names of its land and water boundaries.
- (2) Color the lowland portions and draw the Ganges, Brahmaputra, and Indus rivers.
- (3) Why does the Ganges receive more tributaries from the north than from the south?
- (4) What problem does the Ganges-Brahmaputra present to the people living in its valley?
- (5) What river in North America presents similar problems? (6) Compare the location of Calcutta with New Orleans. (7) Why should

the Indus Valley be so much less densely populated than the Ganges? (8) Compare in length and character the rivers of the east and west slopes of The Deccan.

(9) Compare the average height of The Deccan and the Appalachian Highland. (10) How have the Himalayas been a protection to India? (11) What is the only important gap leading from the west into India?

(12) On the map used in Exercise 1 draw the Heat Equator for January and July; draw arrows to indicate the direction of the winter monsoons; summer monsoons. (13) Write in figures on the map the yearly rainfall of Calcutta, Delhi, Madras, and Bombay. (14) Why does the southeastern coast of The Deccan receive rain from the northern trade winds? The northwest coast from the summer monsoons? (15) For what is the Indus chiefly

important? (16) Why is the health resort of Simla located in the hills? (17) Draw a second sketch map and write the chief products, underlining those which are exported either in a raw or manufactured state. (18) What are the staple food products? (19) What contrasts in farming would you expect between India and the United States?

(20) Where is the population of India most dense? Least dense? (21) Of what advantage to England is the possession of India? (22)

On the second sketch map locate Calcutta, Bombay, Madras, Karachi, and Srinagar. (23) Draw railroads connecting Bombay with the Ganges Valley. (24) Why is Bombay a more important port than Madras?

(25) Account for the location of Karachi. (26) Why is not tea sent overland from India to Europe as it is from China? (27) How would tea from India reach New York City? San Francisco? (28) Why is the commerce of India so largely with the



FIG. 528. *Plowing in the rich agricultural region of Ceylon.*

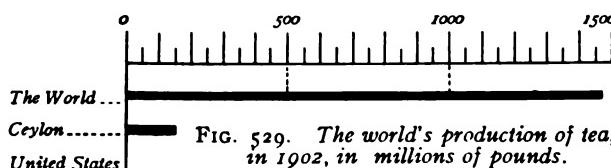


FIG. 529. *The world's production of tea, in 1902, in millions of pounds.*

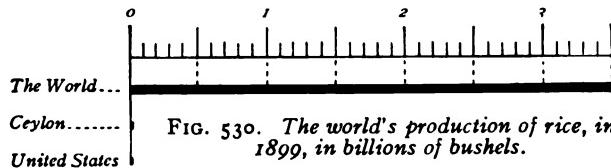


FIG. 530. *The world's production of rice, in 1899, in billions of bushels.*

LXXIII. CEYLON

Size and Situation. Ceylon is about half the size of England, and is separated from southern India by a narrow strait. This strait is so shallow that vessels from Madras to the west coast of India or to the Red Sea have to go around the island. (See Fig. 503.)

Surface and Climate.

The southern half of Ceylon is extremely mountainous, while the northern half is a low, flat plain. The southwestern portion, because of its mountains, receives the moisture carried by both the southwest and the northeast monsoons. Agriculture can therefore be carried

on successfully, and the densest population on the island is found here. (See Fig. 528.)

The northern plains are too low to receive any moisture from the winds which sweep over them, and for that reason receive little rainfall at any time during the year. They are covered, however, by ruins left by ancient people, showing a former dense population.

Productions and

Trade. The mountains of Ceylon are occupied largely by Europeans engaged in operating tea plantations, which have in recent years replaced coffee. The production of tea is the leading occupation, and tea forms more than half the exports. (See Fig. 529.) The lower plains and the hills with a warmer, more moist climate are devoted to rice and cocoanuts. Pearl fisheries



FIG. 531. *A general view of Kandy, an interior city of Ceylon.*

are, as a rule, profitable in the *Gulf of Manar*, but the returns are uncertain. More than two-thirds of the trade is with India and the United Kingdom.

Colombo is a calling port for vessels plying between Europe and the Far East by way of the Suez Canal. It is connected by rail with the hill plantations, and therefore has ready access to the areas furnishing the more important exports.

Questions and Exercises

(1) Draw a map of Ceylon showing the continental shelf connecting it with India. (2) Locate Colombo and draw the ocean route between Madras and the west coast of India. Show the trade route leading from Colombo to the west and the east.

LXXIV. INDO-CHINA

The Peninsula as a Whole. Indo-China, sometimes called Farther India, includes *Upper* and *Lower Burma*, *French Indo-China*, *Siam*, the *Malay States*, and the *Straits Settlements*. The peninsula extends to within ninety miles of the equator. It is narrow and low at the *Kra Isthmus*, which is situated at 10 degrees north latitude. A canal, which has been proposed across this isthmus, would greatly shorten the distance by water between the eastern coast of Asia and Europe.

Surface and Climate. Indo-China is a plateau crossed by range after range of mountains extending north and south, one of these running out to form the Malay Peninsula. Low plains exist in French Indo-China and in the valley of the Iráwadi. The climate is everywhere tropical, with a heavy rainfall, which gives a luxurious vegetation, especially in the Malay Peninsula where dense jungles exist. (See Figs. 119 and 503.)

BURMA

Products. The Iráwadi River valley lies between higher lands covered with teak forests, and is extensively planted with rice. Burma exports more teak than any other country. There are few roads, and most of the transportation of goods is carried on by means of oxen and elephants.

Rangoon, the outlet for the trade of the Iráwadi Valley, is the chief port, and is accessible at high tide to large, ocean-going vessels. Rubber, petroleum, coal, gold, and rubies, together with teakwood, are the chief exports. The rubies found here are the finest in the world. Burma is a part of the Empire of India.

MALAY PENINSULA AND STRAITS SETTLEMENTS

Products; People; Cities. The products of the Malay Peninsula are all tropical in nature



FIG. 532. *A native house in the spice country of the Malay Peninsula.*

and include rice, cotton, sugar cane, sago, gums, and spices. The most important product, however, is tin, which is found in great abundance.

The people of the Malay Peninsula are mostly Malays, or brown people; they are closely related to the yellow people.

The chief cities are *Malacca* and *Singapore*. Singapore is a coaling port for vessels plying between Europe and the Far East. It is a great shipbuilding center with large shipyards, and is near the largest tin-smelting works in the world. The Straits Settlements, which occupy the lower part of the Malay Peninsula, are a part of the British Empire, and give the English control of the Strait of Malacca. Next to India, the Straits Settlements have the largest commerce of any country in southern Asia.

SIAM

Products; Cities.

Siam is an independent country.

The only cultivated areas are the delta and the river banks of the Menam River, which are devoted to rice. Teak grows in the higher hills, and gold and tin are mined in considerable quantities. *Bangkok* is the chief port and town, but it has a poor harbor, owing to the presence of sand bars, and its commerce is unimportant. Siam is not so progressive as India.



FIG. 533. A suburban street near Singapore, giving a good idea of the tropical vegetation.

FRENCH INDO-CHINA

Products; Cities. French Indo-China, a dependency of France, is much like Siam in products and climate. *Hanoi*, the capital and *Saigon*, situated in the delta of the Mekong River, are the chief towns.

Questions and Exercises

(1) On an outline map write the names of the land and water boundaries of Indo-China. (2)

Show by a dotted line the effect of the proposed canal at the Kra Isthmus.

(3) What is the chief food of the people of Burma? (4) How is the climate and soil fitted to raise this grain in such quantities? (5) To what point is the Iráwadi navigable? (6) Account for the location of Mandalay and Rangoon.

(7) To what country does the Straits Settlements belong? (8) What great highway does Singapore control? (9) Name three great ocean gateways in Europe and Asia controlled by the United Kingdom. (10) What does Singapore receive? (11) What does it distribute?

(12) On the map used in Exercise 1, locate Bangkok and Singapore.

LXXV. THE CHINESE EMPIRE

Position and Climate. The Chinese Empire is more than half as large as the whole of North America. It includes *China*, *Manchuria*, *Mongolia*, *East Turkistan*, and *Tibet*. It lies on the eastern coast of the

great continent of Eurasia, and from its great extent has a wide range of climate. The

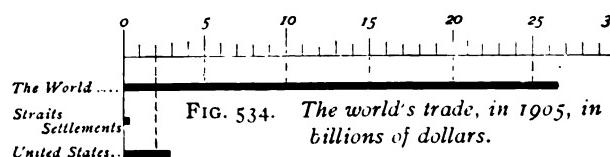


FIG. 534. The world's trade in 1905, in billions of dollars.

winters are cool in the south, cold and rigorous in the north and in the interior, with desert conditions on the high plateaus of Tibet, Turkistan, and Mongolia.

Owing to the great size of the continent and to the extremely low continental temperatures which prevail in the interior in winter, cold climates extend farther south on the east coast than they do in the corresponding part of North America. The southeastern coast lies in a region swept by monsoons and receives abundant rainfall in winter when the winds blow from the sea.

Surface and Drainage. A large part of the Chinese Empire is extremely mountainous and very thinly populated. The most important portion is the group of river plains along the eastern coast. (See Fig. 503.) Here the densest population is found. The water gaps, where the rivers cross the mountain ranges, are narrow and very difficult of passage, owing to the rapids. These rapids have been a great barrier to interior trade.

In spite of the mountains, the Yangtse-kiang is navigable for a thousand miles, and ocean-going vessels can reach Hankow, six hundred and eighty miles up the river. The *Hwang-ho*, or Yellow

River, sometimes called "China's Sorrow," flows in its lower portion across a very flat, alluvial plain. This plain is so level that the river, which is not forced to follow any particular channel, often changes its course. It formerly flowed into the Yellow Sea, but now empties into the Gulf of Pechili. It is subject to floods, which often do immense damage to both life and property.

CHINA

Population.

China is the most important of the several divisions of the Chinese Empire. It is very densely inhabited, and contains nearly five-

sixths of the population of the entire country. Most of the people belong to the yellow race.

Surface and Climate. Southern China is mountainous, contains no plains, and has an extremely rugged coast. The harbors are

excellent, but are difficult of access from the interior, so that oceanic commerce is imperfectly developed. The climate is tropical or subtropical, with wet and dry seasons. Northern China has a low and sandy coast with few harbors.

Products of the Soil. Tea, silk, rice, sugar cane, opium, and cotton are the most important products of the soil. Rice is grown wherever possible, and forms the chief food of the



FIG. 535. An old stone arched bridge on the Ta-hu Lake, China.
Notice the seven-story pagoda in the distance.

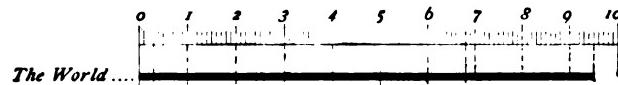


FIG. 536. The world's production of cotton,
in 1905, in billions of pounds.

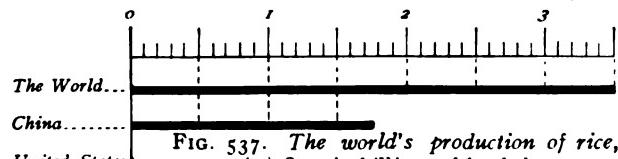


FIG. 537. The world's production of rice,
in 1899, in billions of bushels.

people. In southern China the mountains are covered with heavy forests in which mulberry trees thrive. The raising of silkworms, which feed upon the mulberry, is the most important industry. Tea is grown in the west and south; and sugar and cotton in the south. (See Figs. 511, 537, 538, and 539.)

In northern China the soil is mostly made of detritus blown by the winds from the deserts farther inland and brought down by the rivers. This soil is very fine and yellow. It is easily blown about, and everything it rests upon is yellow like the ground; in fact, this portion of the country is sometimes called "The Yellow Kingdom." The soil is fairly fertile, but irrigation has to be employed in order to raise crops, and wells dot the country as they do in India. Pigs, poultry, and dogs are to be found almost everywhere.

Mineral Products.

The mineral deposits of China are especially valuable. China is the only country having coal fields rivaling those of the United States, but owing to the backwardness of the people, little coal has been mined. The chief mineral products are iron and pottery clay.

Manufacturing. Owing to the fact that the Chinese have not kept in touch with modern methods of business and have not made use of their abundant natural resources, manufacturing is only slightly developed in China, and is mostly done by hand. Silk,

cotton, paper, and porcelain goods are the leading manufactured products.

Transportation. Interior communication in China is poor except over the plains and along the main waterways. There are few highways and fewer railroads. The building of railroads was at first opposed by the government, but is now encouraged, and railroads are increasing rapidly, especially about Peking.

The interior trade is largely carried on by caravan. The Grand Canal, extending from Tientsin-fu to the Yangtse-kiang, a distance of

seven hundred miles, makes it possible for the products of the plains to be brought to the sea.

Cities. The principal trade of China with foreign countries is carried on at the "treaty ports," that is, ports which have been opened to foreign trade, and which are the only places

where foreign vessels are allowed to load or discharge their cargoes. At first these were few in number, but now they include nearly all the river and coast towns.

Shanghai, at the mouth of the Yangtse-kiang, is the largest

industrial city, and the only good port along the northern coast.

Hong-kong, built on an island at the mouth of the Canton, a British possession since 1842, is the most important port except Shanghai.

Hankow is an active river port. *Tientsin-fu*, the port of Peking, has a poor harbor, but is the treaty port of northern China. (See Fig. 511.)

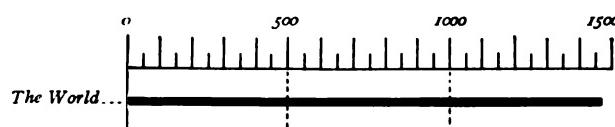


FIG. 538. *The world's production of tea, in 1902, in millions of pounds.*

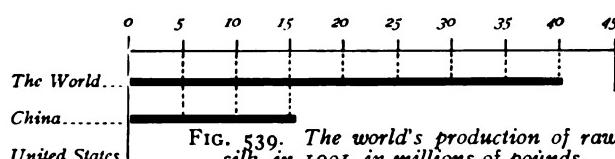


FIG. 539. *The world's production of raw silk, in 1901, in millions of pounds.*



FIG. 540. *The busy "treaty port" of Tientsin-fu.*

Peking, the capital, is the best known city, and because it is the seat of the government is the first city of China in many ways. Because of its position close to Mongolia, it is of great strategic importance. (See Fig. 509.)

Trade. China ranks third in commerce among the Asiatic nations. Most of its trading is with the British port of Hong-kong, Japan, the United Kingdom, and the United States. The chief exports of China are characterized by great value in small bulk. China is the leading country of the world in the production of raw silk, and exports large quantities of tea, most of which is carried overland. The tea industry has declined in recent years, owing to the development of the tea plantations of India and Ceylon. Yet China still exports more than twice as much tea as India, the next greatest tea-producing country of the world. The principal imports are cotton and opium. The chief export to the United States is tea. Our country supplies China with a large part of its cotton goods, and with some wheat and flour. Regular lines of steamers ply between the United States, China, and Japan. (See Fig. 542.)

Industry and Enterprise. The chief reasons for the backwardness of China are the extreme conservatism of the people, which prevents them from adopting new inventions, and their religion, which teaches them to reverence the old and therefore prevents the introduction of new and progressive methods and ideas.

Although the Chinese are particularly

backward at the present time, yet it must be remembered that they once led in invention, and that the use of the compass and printing were known in China long before they were in any other part of the world.

TIBET

Characteristics and Products. Tibet is a lofty and barren country with an extremely severe climate. (See Fig. 503.) The scattered population is most dense in the valley of the Brahmaputra. Sheep and goats form the principal wealth, although the yak is an important beast of burden. Cashmere wool

is the most valuable product.

The only town is *Lhasa*, the holy city for the Buddhists, in which no foreigners are allowed. In fact, the people of Tibet are so unfriendly to foreigners that large parts of the region are but little explored and little known.



FIG. 541. *The harbor of Canton, showing the types of native river craft.*

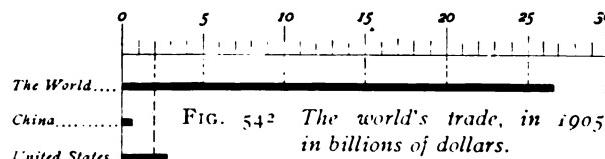


FIG. 542. *The world's trade, in 1905, in billions of dollars.*

CHINESE TURKISTAN

Surface and Trade. Chinese Turkistan is mostly an arid, desert-like tableland with a sparse, nomadic population. The only cultivated regions are in the oases at the foot of the mountains. *Kashgar* and *Yarkand* are the leading towns. They carry on a considerable caravan trade with China.

MONGOLIA

Climate and People.

Mongolia is mostly made up of the great desert, *Gobi*, one of the largest and driest

arid regions in the world. The people are nomads, following their herds of horses, camels, and sheep. They have no industries, and few products to contribute to the world's trade.

MANCHURIA

Industries. Manchuria is a mountainous region with valuable, but little worked, deposits of coal and iron. Farming is carried on along the river valleys; grazing is the leading industry elsewhere.

Cities. *Dalny*, under Japanese control, at the end of the Trans-Siberian Railway, and *Port Arthur*, a Japanese naval station on the Yellow Sea, are the chief cities. *Harbin*, at the junction of the Manchurian and Trans-Siberian railways, is a growing railway town, and *Mukden*, on the Manchurian Railroad, besides being the capital, is an important military stronghold.

Questions and Exercises

(1) On an outline map write the names of the countries composing the Chinese Empire. (2) Color China in pale yellow. (3) Locate five important treaty ports and the Japanese port of Port Arthur.

(4) Where is the most thickly peopled part of China? (5) Why is the Hoang-ho called "China's Sorrow"? (6) What river in North America may be compared with the Yangtse-kiang because of the number of large towns on its banks?

(7) Locate Hankow. Give a reason why a town should grow up here. (8) What is exported from Hong-kong? (9) What are the disadvantages of the location of Peking? (10) To what race do the Chinese belong? (11) To what part of the United States have they emigrated in great numbers? (12) What do they do there?

(13) What geographical reason can you give for the fact that Tibet is so little explored? (14) Why is Manchuria desired by Russia? (15) Find out something about the building of Dalny. (16) Explain the advantages of the position of Port Arthur as a Japanese port.



FIG. 543. *In the mountainous country, Tibet. Notice the farmhouse in the foreground built of stones gathered from the barren surface.*

LXXVI. KOREA

Surface and Climate. Korea is a mountainous peninsula about as large as Great Britain, lying between the Yellow Sea and the Japan Sea. It is an independent country, but is under the general control of Japan. The winters in Korea are severe and the summers are wet. The climate in spring and autumn is delightful.

Products; Trade. Forests abound in the hills of Korea, and barley, oats and millet are raised in the valley regions of the north, where the summer climate is similar to that of northwestern Europe. Maize, rice, and tobacco are the principal products in the more temperate south, where the valleys produce two crops a year.

The exports include ginseng, a root which is sent to China, hides, beans, and rice. The chief imports are cotton goods from the United Kingdom and the United States. *Soul* is the capital, and *Chemulpo* is the principal port.

Questions and Exercises

(1) Draw a diagram showing the position of Korea in relation to Japan and Russia. (2) Draw the boundary between Japan and Korea; Russia and Korea.

(3) Why should each country be so anxious for this peninsula? (4) Compare the climate of Korea with that of Iceland. (5) Compare the products. (6) Why is not Korea a progressive region like the United Kingdom? (7) Compare the latitudes of the United Kingdom and Korea and explain the differences in climate.



FIG. 544. The effect of an earthquake in Japan. Notice the warping of the railroad bridge.

LXXVII. THE JAPANESE EMPIRE

The Japanese Empire includes all the islands from Kamchatka to the Philippines, with the exception of half of Sakhalin and the peninsula on which Port Arthur is located. The principal provinces are *Nippon* (*Hondo*) or *Japan*, and *Formosa*.

Surface. Japan is made up of extremely mountainous and volcanic islands. It has more than fifty active and extinct volcanoes, the most symmetrical and beautiful of which is *Fuji-yama*. Owing to the volcanic activity, the country is shaken by severe earthquakes each year, and all buildings have to be constructed so as to withstand these shocks. (See Fig. 544.)

The surface of Japan is extremely rugged. Partly for this reason there are few railroads and practically no highways to the interior, so that wheeled vehicles, except those drawn by men, are rare.

Climate and Vegetation. The climate of the Japanese Empire is both oceanic and continental in its character. Snow lies in the north until May, and copious rains fall in the south during the summer monsoon. The west coast receives some rain during the winter season when it is reached by the westerly winds blowing out from the continent.

Owing to the genial climate during the summer, the growth of vegetation is very rapid. One of the principal plants is the bamboo, which is used for furniture and paper; the tender shoots are used as food. Forests abound in the north.

Products of the Soil. Nearly one-eighth of the area of Japan is devoted to agriculture. The tools used are still,

in many sections, very primitive. (See Fig. 547.) In spite of unfavorable conditions, however, agriculture succeeds very well. Inasmuch as agriculture is carried on wherever possible, little room is left for live stock. Japan produces little butter, milk, cheese, or native wool.

The alluvial plains and terraced mountain slopes of the south, where the climate is warm and moist, are chiefly devoted to rice, sugar, and cotton. Cereals abound in the cooler north. Fruits of all

kinds are raised in great abundance and grow to a large size, but they lack the sweetness of similar fruits raised in the more severe climate of the eastern United States. Mulberry trees are cultivated as food for silkworms in most of the provinces.

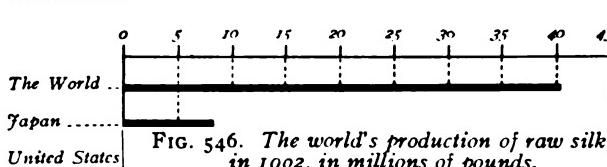
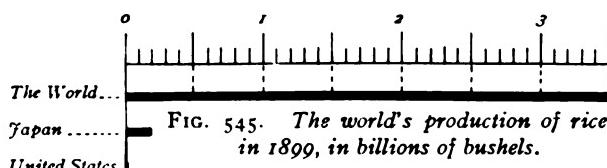


FIG. 547. Primitive plowing in the less civilized mountain districts of Japan.

Tea is grown in the southern provinces in great abundance.

Mineral Products. Japan has rich coal fields, especially in the island of Yezo. Sulphur is produced abundantly, as it is in most volcanic regions. Iron and kaolin for pottery are the other important earth products.

Manufacturing. Manufacturing in Japan is generally backward. It is mainly confined to handicrafts, to cotton and silk weaving, paper making, and the production of matches. The wood of the forests produces the material for matches, as it does in Sweden, and the Japanese are now making matches for export, particularly to the eastern coast of Asia.

Trade and Enterprise. Interior communication in Japan is poor, but nearly every city is a port. *Yokohama*, the port of Tokyo, the capital, has an excellent harbor, and *Nagasaki* is an important ship-building center, from which much coal is exported. (See Fig. 511.) The trade of Japan is nearly as great as that of China, and is largely with the United Kingdom, the United States, China, and Germany. (See Fig. 511.) Silk, cotton goods, and coal are the most important exports. Tea is a valuable product in trade. Sugar is imported from China, and machinery and cottons from Europe and America. As is the case with China, the best known export to our country is tea; petroleum is sent in return. The Japanese, in contrast with their neighbors in China, have readily adopted European cus-

toms and industries, and are therefore progressing rapidly.

FORMOSA

Surface and Products. Formosa, the most southern island of the Japanese Empire, is extremely mountainous. It is important chiefly for its tea and camphor. Indeed, it is the chief source of supply for camphor.

Questions and Exercises

(1) In what ways may Japan be compared with Great Britain? (Consider situation, coast line, and harbors.)

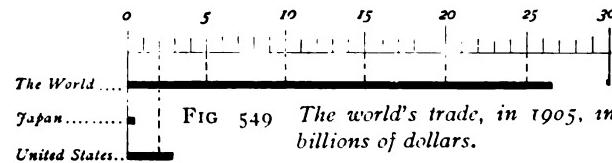
(2) What facts as to soil and climate render the plains so productive? (3) Find out by reading or from pictures how the buildings in Japan have to be constructed to withstand earthquake shocks.

(4) What Japanese manufactured articles have you seen? (5) Name any you may have in your home. (6) Through what American ports do products from Japan reach our country? (7) What does the United States export to Japan? (8) Why would you expect sulphur to be a product of Japan? Of southern Italy? (9)

Try to imagine how different your food would be if the United States, like Japan, produced few dairy products.



FIG. 548. Japanese girls picking silkworm cocoons from the straw beds.



LXXVIII. THE MALAY ARCHIPELAGO

Ownership and Characteristics. The Malay Archipelago is made up of all the islands southeast of Asia, except those belonging to China and the Japanese Empire. (See Fig. 554.) It includes *New Guinea* with the

neighboring islands, and the *Philippines*, which now belong to the United States. Most of the islands of the Malay Archipelago

belong to European powers and form important colonies on account of their products. *Sumatra*, *Celebes*, *Java*, most of *Borneo* and *New Guinea*, and the *Moluccas* belong to the Netherlands. Taken together this group of islands is known as the *Dutch East Indies*.

Climate. The climate of the Malay Archipelago is everywhere moist and tropical, with little range in temperature and with only slight changes in the weather from day to day.

Plants and Animals. West of Wallace's Line, a line running between Borneo and Celebes which marks the division between two different animal and plant regions, are found palms, bamboos, laurels, oaks, and other trees common to Eurasia. Monkeys, tigers, rhinoceroses, tapirs, and elephants abound here, as they do throughout the Oriental Region.

East of Wallace's Line the trees are the tall eucalyptus and other forms characteristic of Australia. The animals are similar to those of the Australian Region. (See page 76.)

Products. The products of the Malay Archipelago are all tropical, and are of great value to the rest of the world.

In Java, which is one of the most important islands, coffee is the principal product, but this is now giving way, as it is in Ceylon, to tea and also to the growth of cinchona. *Batavia* is the principal city. (See Fig. 559.)

Tobacco is the chief product of Sumatra, coffee and cacao of the Celebes, and pepper of Borneo. The Molucca or Spice Islands furnish most of our cloves and nutmegs.

Tin is found in considerable quantities in the islands of *Banka* and *Billiton*, and is the only important mineral mined in the archipelago.

Questions and Exercises

- (1) Make a list of the islands of the Malay Archipelago. (2) Opposite each write the name of the country to which it belongs. (3) Underline the two largest islands of this group.

(4) What is the yearly rainfall of these islands? (5) What coasts in America have an equal rainfall? (6) On an outline map draw Wallace's Line, and write the names of the plants and animals peculiar to each side of the line.

(7) Make a list of the chief products of the Malay Archipelago. (8) Which influenced the development of caravan and ocean trade in early times?

(9) Write a list of countries outside of Asia owning possessions in Asia. (10) Opposite each write the names of the possessions owned by that country.

SUMMARY

Asia, the largest of the great land masses, contains the broadest plains, the loftiest and the most extensive highlands, and the greatest area of interior drainage of any continent in the world. Owing to its size and position, it has the widest range of climate known; and because of the severity of its climate in the central and northern portions, large areas are sparsely populated and little known.

In general it is an unprogressive continent. Agriculture and grazing are the chief occupations of the people. Manufacturing has been of little importance, but is developing rapidly in some countries, owing largely to the influence of Europeans, or to the enterprise of those nations which have adopted European methods.

Asia has a little more than one-tenth of the commerce of the world, at least one-third of which is centered in India. India and the Straits Settlements have more than one-half of the commerce of the continent, and these regions, together with China and Japan, have more than three-fourths of it. The commerce of eastern Asia is destined to grow apace as the countries come more in touch with the peoples of Europe and America, as they are bound to do as the years go on. In that commerce of the future the United States, owing to its position across the sea from Asia, and its near-by possessions in the Philippines, will have a leading place.

AUSTRALIA AND THE ISLANDS OF THE PACIFIC

LXXIX. AUSTRALIA

Size and Situation. The continent of Australia is about as large as the United States, not including Alaska and the other dependencies. It lies entirely in the subtropical and the temperate regions. It is the only considerable land mass in the water hemisphere, and is, therefore, the most isolated of all the continents. (See Figs. 26 and 28.)

Coast Line. The shore line of Australia is long and regular with few indentations; as a result the continent has few good harbors. Vessels proceeding along the wind-swept eastern coast are protected by the *Great Barrier Reef*, which extends along the northeastern shore for more than twelve hundred miles. This reef, which has been built by corals, is from twelve to fifteen miles off shore, and in places is a hundred miles wide. (See Fig. 552.) Quiet water usually prevails inside the reef and affords great protection to vessels in their passage along the coast. The channel of deep water is so narrow and tortuous, however, that sailing vessels rarely use this inside passage. If they do use it, they are obliged to anchor at night.

Surface and Drainage. The great mountain system of Australia is the *Dividing Range* along the eastern and southeastern coast.

This range is low in places, but attains mountain altitudes in the southeast, where peaks known as the *Australian Alps* rise over 7,000 feet. (See Fig. 553.) The Dividing Range separates the interior plain from the coastal valleys and contains the headwaters of the only considerable river of Australia, the *Murray River*, with its tributary, the *Darling*. The Murray River is navigable at certain seasons for 1,700 miles, but a large sand bar at its mouth makes it difficult to enter and restricts its usefulness as a highway of commerce.

The western portion of Australia is a plateau about a thousand feet high, from which a few short rivers flow into the Indian Ocean during times of rain. The greater portion of the interior is an undulating plain containing many salt basins and short streams of inter-

ior drainage. Large parts of this region are but little known. The southern coast rises rather abruptly from the ocean to a height of about five hundred feet, and for a distance of seven hundred miles has no streams entering the sea.

Climate. During December and January Australia lies entirely in the southern trade-wind belt, but in June and July the southern part is in the region of the southern prevailing westerlies. The Dividing Range, lying on the windward side of the continent, has an



FIG. 550. Australia, showing its position in the water hemisphere far from any other continent.



FIG. 551.

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Revised, 1906

important influence upon the rainfall. The trade winds lose most of their moisture in this range, and after crossing the mountains descend into the interior as drying, warming winds. (See Fig. 97.)

The rainfall along the eastern and the northern coasts is a little more than forty inches a year. It reaches a maximum of more than eighty inches, however, in the northern portion of the Cape York peninsula. Over large sections of the interior the rain-

fall is less than five inches a year and the region is therefore a desert.

During the southern summer, which reaches its height in January, the winds blow in toward the continent from nearly all directions, and the interior at that season is extremely hot. The average temperature of the interior in January is more than ninety degrees Fahrenheit. In winter the winds blow out from the continent as they do in Asia, and for that reason the interior at that

season is cold. The whole of Australia south of the Gulf of Carpentaria has an average winter temperature of between fifty and seventy degrees Fahrenheit.

In summer the Heat Equator lies over southern Australia, so that this region receives a heavy rainfall from the northwest trade winds. In winter when the Heat Equator has moved northward

the southeasterly trade winds prevail, so that the northern part of the continent has a climate like India and other countries that are swept by monsoons. (See Fig. 84.)

The southeastern and southern coasts have no frost at sea level, and thus the growing season in those districts is long. During the prevalence of the westerly winds, southwestern Australia and the island of Tasmania receive some rain.

Vegetation. The distribution of the vegetation in Australia is determined largely by the surface features and the climate. The northern coastal area is occupied by tropical forests and savannas. In the trade-wind regions of the southeastern coast lowly shrubs abound, and in the interior, steppes and deserts occupy almost all the area.

The eastern steppes are covered with grass and contain some oak forests; it is here that sheep are found in great numbers. The sheep find an admirable food in the long kangaroo grass which grows rankly during the growing season and

dries on the stalk. In the dry regions there is much "salt bush," as the characteristic vegetation is called. The salt bush makes an excellent sheep food, and the wool from sheep raised in this region is especially fine.

The vegetation of Australia, as has already been stated (see page 316), is unlike that found anywhere else in the world. The continent is particularly rich in

ferns and in tall forest trees, of which the eucalyptus, whose tall, straight, slender trunks often grow to a height of more than four hundred feet, is the best known.

Animals. The wild animals of Australia all belong to the Australian Region, and have already been described. (See page 76.) The common domestic animals of Europe have been extensively introduced and are of great importance. Rabbits, which were first brought into the commonwealth for pets and

for food, have run wild and have so increased in numbers that they are now pests. Enormous sums of money have been spent in trying to rid the country of these animals, but without success.

People. The native people of Australia belong to the black race and are among the most primitive people in the world.

They use only the simplest implements, and have no form of government. They are rapidly dying out, however, so that there are probably not more than sixty or eighty thousand of them left.



FIG. 552. *A section of the Great Barrier Reef.*



FIG. 553. *The towering peaks of the Australian Alps, with a portion of the broad interior plain.*



FIG. 554.

The important people of Australia at the present time are the English, who have developed the continent to its present condition.

The five colonies of Australia, together with Tasmania, were combined under one government in 1901, forming the *Commonwealth of Australia*. The seat of government, now at Melbourne, eventually is to be in New South Wales and distant not less than one hundred miles from Sydney.

Products of the Soil.

The valuable products of the soil are nearly all derived from animals and plants which have been introduced by the Europeans. The native animals are of little value; sheep are the most important domesticated animals. The sheep of Australia produce the finest merino wool, especially in the grassy region of the Murray River and its tributaries and in the salt bush. The sheep farms, known as "sheep runs," are leased from the government. (See Fig. 555.)

The most important agricultural regions of Australia are *South Australia* and *Victoria*. Wheat is the chief crop in the temperate, sunny south. Sugar cane is the leading crop of *Queensland* and northern *New South Wales*, though these regions also produce bananas, oranges, and other tropical products.

Irrigation is practiced very extensively in northwestern Victoria; the water is drawn from the Murray River. On the irrigated regions valuable crops of oranges, figs, apricots, plums, and tobacco are raised. There

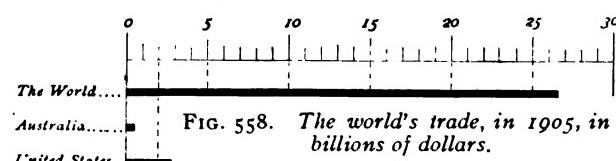
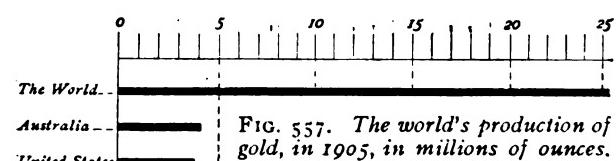
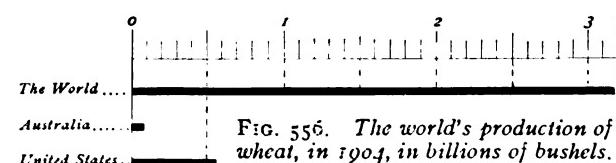
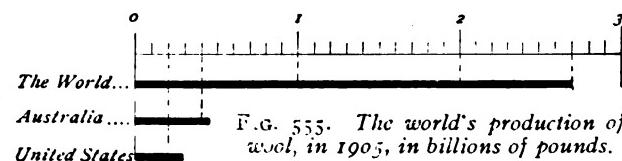
are some agricultural areas scattered through *Western Australia*. The climate, however, is generally unfavorable to agriculture, and most of the fields are at a distance from the only available harbor of *King George's Sound*.

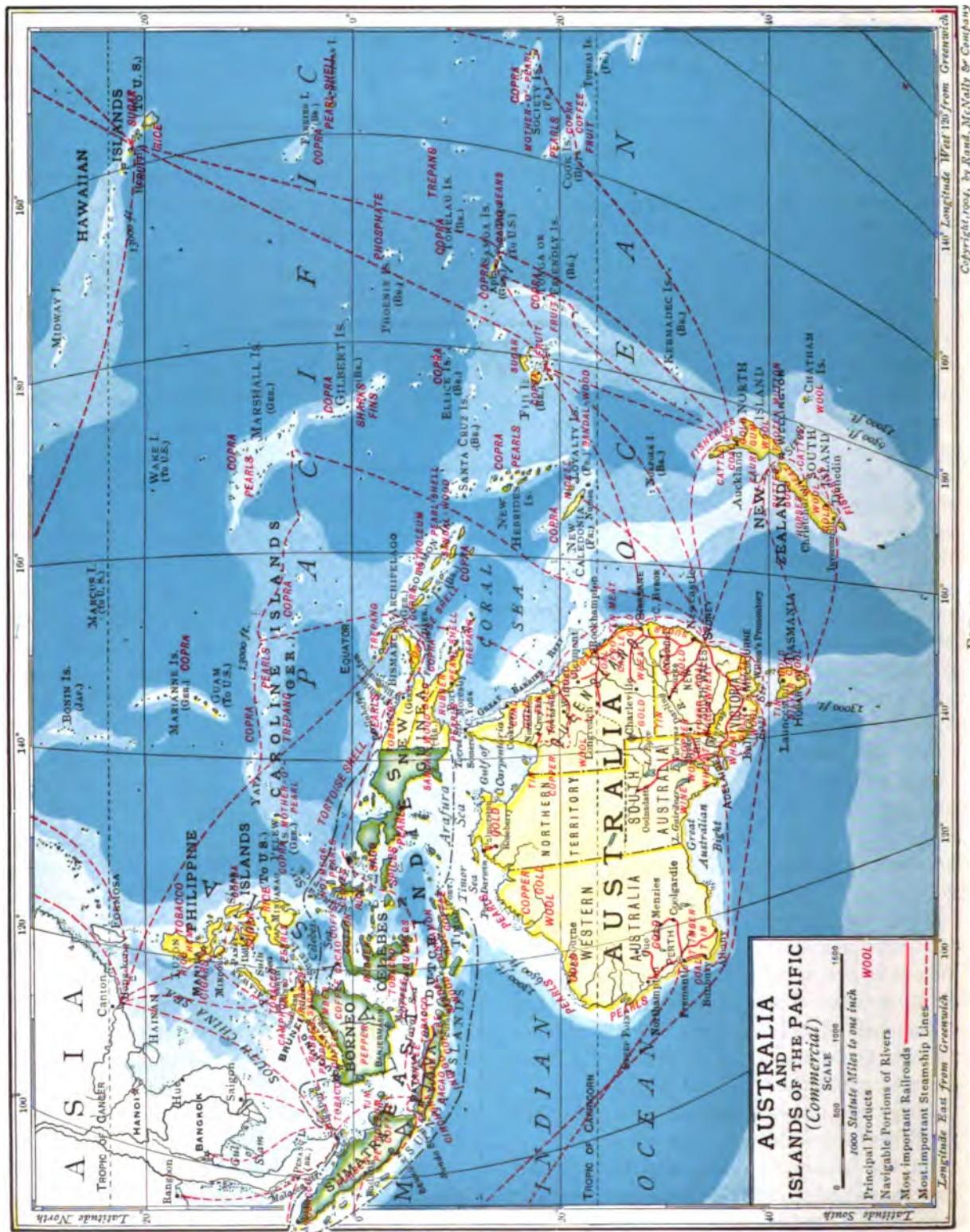
Mineral Products. Gold was discovered in 1851. It is the chief mineral product of Australia, and is found largely in Queensland, New South Wales, Western Australia, and Victoria. Silver occurs and is mined chiefly in New South Wales and Queensland. Copper, tin, coal, and iron are abundant. Coal is mined in New South Wales. Pearls are found off the western coast, and pearl fishing is carried on in Western Australia.

Trade. Australia is deficient in means for interior communication. There are few highways, and most of the railroads are

confined to the areas of somewhat dense population along the southeastern and eastern coasts. The leading towns are connected by a number of narrow-gauge roads with the gold, silver, and copper mines of the mountains. All the states are connected with Europe by steamers, and a cable across the Pacific to British Columbia was completed in 1902.

Wool and gold are the chief exports of Australia. Most of the gold comes from Western Australia and Victoria; the wool from New South Wales, Queensland, and South Australia. The imports are chiefly textiles, manufactures, wheat, and sugar. Nearly one-half of the trade is with the





mother country, and a little over one-tenth with the United States. The most valuable export to the United States is wool; the imports from our country are largely lumber and machinery.

Cities. With the exception of a few mining centers in the interior, all the large towns and cities of Australia are on or very near the seacoast. This is due to distribution of the rainfall which makes the eastern coast the leading agricultural region of the continent.

By far the largest part of the imports and exports of Australia go through *Melbourne*. Melbourne is a very picturesque city, situated in the midst of beautiful scenery. It has an excellent harbor, well equipped with docks, shipyards, and the other necessities for carrying on commerce. (See Figs. 560 and 561.)

The second commercial city of Australia is *Sydney*. It has a fine harbor, and is the terminus of most of the oceanic mail routes. Both Melbourne and Sydney are well situated for trade, because they are within easy



FIG. 560. *Melbourne*. Across the water is the industrial portion of the city. Vessels from Europe stop at Adelaide and leave their mails, which are sent by rail to the other chief cities of the commonwealth.

Questions and Exercises

(1) Compare the latitude of Sydney, Melbourne, Rio Janeiro, and Port Natal. (2) About how far from San Francisco is Sydney? (3) Trace the route you would take from San Francisco to Sydney. (4) Name the waters passed through and the probable cities stopped at. (5) How does a telegram from Melbourne reach London?

(6) What part of Australia receives rain from the northwest trade winds? From the southeast trade winds?

(7) In what season does Perth have rains? In what months? (8) How does the Dividing Range affect the climate of eastern Australia? (9) Tell how the Dividing Range plays a part similar to the Sierra Nevada; the southern Andes. (10) Why should the interior of Australia be dry in summer?



FIG. 561. *Victoria street, the business center of Melbourne*.

when winds are blowing toward the land? (11) At what season is the Murray River navigable for the greatest distance?

(12) Draw two sketch maps; one to show the position of the Heat Equator and the direction of the winds in January, and one to show the same for July.

(13) Color both maps showing the heavy, moderate, and light rainfall. (14) On these maps write the chief vegetation areas.

(15) Compare the basin of the Murray-Darling River with that of the Mississippi.

(16) If the Dividing Range were 1,000 feet lower what would be

the effect on the climate and the rains of eastern Australia? (17) What would be the result if the Dividing Range ran between the Gulf of Carpentaria and the Australian Bight?

(18) Make a list of the states of the Commonwealth of Australia and write opposite each the name of the chief town. (19) Tell how the climate and the surface have affected the distribution of population.

LXXX. TASMANIA AND NEW ZEALAND

TASMANIA

Climate and Products. The western portion of the island of Tasmania is a highland, rising between two and three thousand feet. Eastern Tasmania is level and open and forms an excellent grazing region. The climate of the island is similar to that of England, but much colder; it is well adapted to the raising of hops and fruit. The westerly winds bring plenty of rainfall, which is uniformly distributed through the year. Copper, silver, and tin are the chief mineral products.



FIG. 562. Cattle grazing in the rich, level lands of eastern Tasmania.

Hobart, picturesquely situated on a fine harbor, is the only town of importance. Its position on the south side of the island is in a way unfortunate, as it is so far distant from Australia.

NEW ZEALAND

Situation and Coast Line.

The colony of New Zealand, consisting of two large islands and many smaller ones, is situated more than a thousand miles southeast of Australia.

In the southwest there are many beautiful fiords, which form fine harbors. These harbors are of little value, however, because they have no good connection with the productive country to the east of the mountains. The important seaports are on the eastern coast.

Surface. The surface of New Zealand is generally mountainous. The mountains near the southwestern coast, known as the *Southern Alps*, rise to an altitude of 7,000 feet, and are covered by glaciers and forests.

Throughout a large part of the southern island the mountains rise like a wall and are without gaps or passes. In the northern island there are many volcanic peaks, some of which are still active. Hot springs and geysers are numerous; New Zealand has one of the three geyser regions of the world.

The only extensive lowland of New Zealand is the *Canterbury Plain* along the central eastern coast of the southern island. It is



FIG. 563. Mount Rolleston, New Zealand. Notice the vapor which is rising from the mountain slopes.

composed largely of arable land, and on the west merges into the mountain slopes, which, from their position on the leeward side of the mountains, are bare. Forests which produce timber of value are found on the western slopes of these mountains. Good agricultural land is also found on the small plains which are scattered along the coasts of the northern island.

Climate. New Zealand lies in the region of the "roaring forties," and is therefore swept by strong winds. The rainfall, which is more than forty inches a year, is heaviest on the western side. The climate on the whole is warmer than that of England.

Products. The agricultural products of New Zealand are similar to those of England; wheat and oats are the most important.

Large portions of the islands are occupied by rich pastures which support great numbers of sheep, cattle, and horses. The deposits of gold and coal are extremely rich.

Trade; Cities. Nearly three-

fourths of the trade of New Zealand is with the United Kingdom, and the rest is practically all with Australia, and the United States. The chief exports are various products of the grazing industry. New Zealand sends to the United Kingdom enormous quantities of the best frozen mutton received there. Horses, cattle, and butter are sent to New South Wales.

Auckland, the largest town, is important as a coaling station for vessels plying between Sydney and San Francisco. The next city in rank is Wellington, the center of the local government.



FIG. 564. Lake Wanaka. Scene from the village of Pembroke, New Zealand.

Questions and Exercises

(1) Compare the latitude of Tasmania and England. (2) Why is England warmer? (3) In what way is the climate like that of England? (4) In what way is Tasmania like Ceylon? (5) Name the strait separating island and mainland in each case. (6) How far is it from Hobart to Sydney? Hobart to Auckland?

(7) Compare the average summer and winter temperature of New Zealand. Account for the slight range. (8) Why should there be glaciers on the mountains? (9) What can you say of the scenery of New Zealand? (10) On a map of the world show the importance of Auckland. What towns are connected by the cable between New Zealand and Australia?

LXXXI. THE ISLANDS OF THE PACIFIC OCEAN

The Pacific Ocean is dotted with a great number of single islands and groups of islands, most of which are on the western side. Some of these, especially the Philippines, which are dependencies of our own country, we have already considered.

Ownership; Climate; Products. The larger number of the islands of the Pacific belong to Germany, France, or the United Kingdom, or are under the protection of these governments. Most of them lie in the tropics and have a tropical climate. Many of them are of volcanic or of coral formation. The chief products are tropical in their nature, and include bread fruit, cocoanuts, sugar cane, nutmegs, and pepper.

MELANESIA

The Solomon Islands, the New Hebrides, New Caledonia, and the Bismarck Archipelago are often grouped together. They are

called *Melanesia*, meaning the *Islands of the Blacks*, as they are inhabited mostly by Papuans, or natives of New Guinea.

POLYNESIA

Characteristics and People. The small islands lying east of the longitude of New Zealand are known as *Polynesia*. They are inhabited mostly by black or brown people, and are almost all in the tropics. Many are surrounded by coral reefs, so that the offshore lagoons form good harbors. Bread fruit is produced throughout the region, and forms the chief food of the people.

Surface and Climate. The most important islands are the *Fiji* and *Samoa* groups.

The Fiji Islands lie in the southeast trade-wind belt and their mountain slopes, rising more than 4,000 feet above the sea, have an abundant rainfall. The scenery is grand. These islands form a calling port for vessels crossing the Pacific, and are of some importance in commerce. They belong to the United Kingdom.

The Samoa Islands are similar to the Fiji Islands in climate and in surface features. The islands are liable to be swept by great storms, so that their harbors are not always safe. They belong to Germany, except *Tutuila* and the other islands east of the parallel 171 degrees, which belong to the United States. *Tutuila* is small and of little importance except for the harbor and coaling station of *Pago-Pago*.

Products; Trade. The chief products of the Fiji Islands are tropical fruits and sugar cane, though grazing products are

increasing, owing to the introduction of cattle. Turtle and pearl shells and fish are secured along the coast. The trade is principally with the United Kingdom and Australia, from which machinery, cotton goods, and hardware are imported.

Copra, or the meat of the cocoanut, is the chief export of the Samoa Islands.

Questions and Exercises

- (1) Cut a map of the world in two so that by joining the pieces you can have a whole map of the Pacific Ocean.
- (2) Locate the chief islands of Melanesia and Polynesia.
- (3) By using different colors indicate the nations to which these islands belong.
- (4) On the maps write the chief exports for which each group is important, and draw trade routes from these islands to the different nations to which they belong.
- (5) Make a list of all the islands of the Pacific that are continental rather than oceanic.

SUMMARY

Australia is the smallest and the most symmetrical continent. The climatic features are regularly distributed because the continent lies for a large part of the year in the region of the trade winds. The distribution of rainfall is strongly influenced by the distribution of the surface features; it is greatest on the windward slopes of the highlands and least in the low plains of the interior. The climate and surface are both favorable to grazing, so that this industry is the best developed. Australia has about two per cent of the commerce of the world, of which one-half is with the United Kingdom, and a little over one-tenth with the United States. The common-

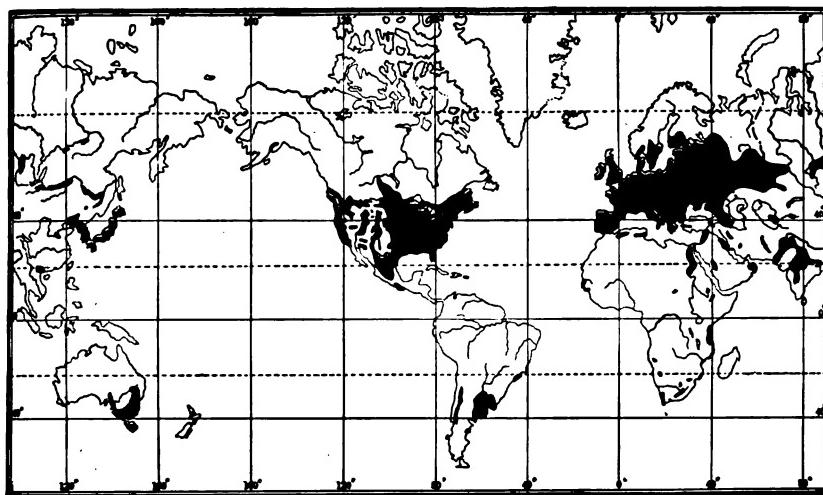


FIG. 565. Carriers in the Fiji Islands.



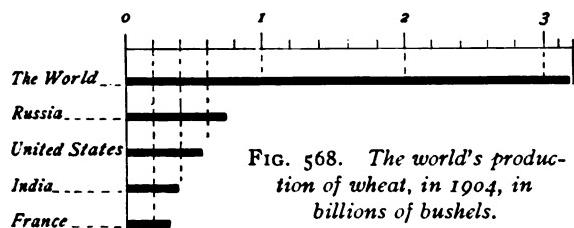
FIG. 566. A mother and children, in the Fiji Islands.

wealth is increasing rapidly in importance and is one of the most valuable and progressive colonies of the United Kingdom.

FIG. 567. *The wheat-producing areas of the world.*

LXXXII. A BRIEF SUMMARY OF THE WORLD'S COMMERCE AND INDUSTRY

The Agriculture of the World. Inasmuch as every one is dependent on the products of

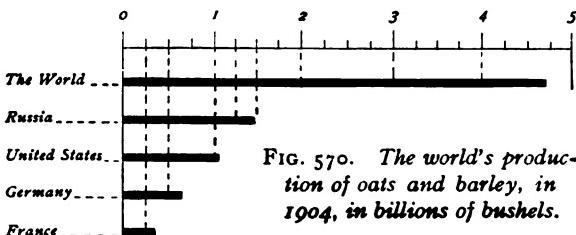
FIG. 568. *The world's production of wheat, in 1904, in billions of bushels.*

the soil for his food, agriculture and grazing are important occupations in all parts of the world. In the agricultural regions of the tropics crops can be raised easily because the deep, rich soil and moist climate favor the rapid growth of vegetation. In the temperate lands the climate is more changing, and hence even where the soils are rich the lands have to be tilled during the growing season in order to secure

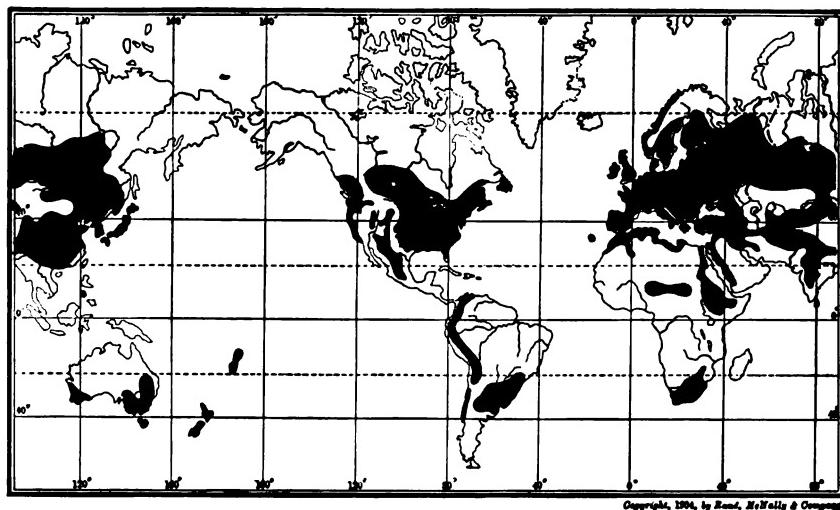
the best returns from the soil. Therefore agriculture as an occupation is best developed in the temperate regions and especially in the North Temperate Belt, where the population is much more dense than it is in the South Temperate Belt, and where the demand for food is consequently greater. (See Figs. 74, 119, and 169.)

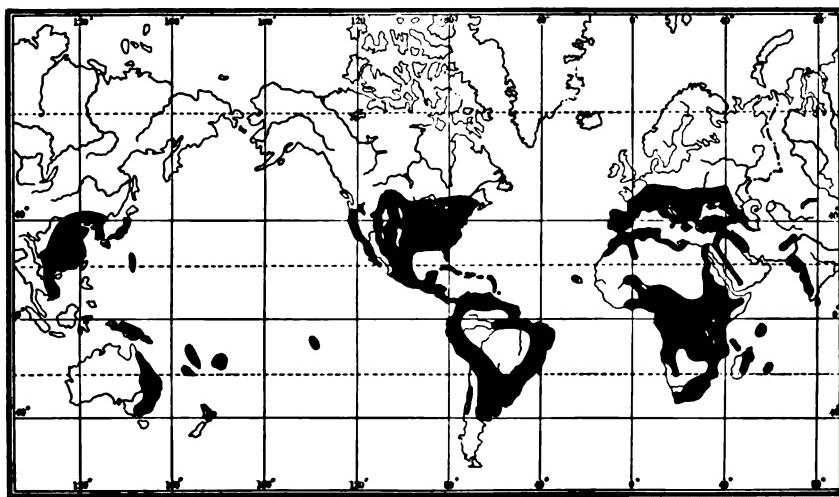
The Leading Crops of the Temperate Regions. The chief crops of the temper-

ate regions are cereals, especially wheat, rye, oats, barley, and corn. Wheat and rye are the

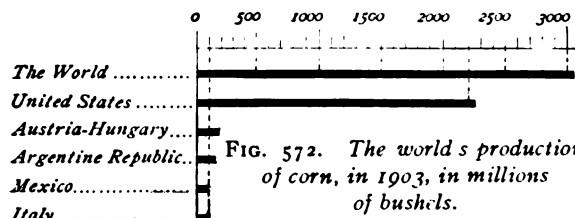
FIG. 570. *The world's production of oats and barley, in 1904, in billions of bushels.*

principal cereals used for food by the white race, while corn and oats are grown principally for stock, though both are used as food for people in certain countries. Wheat is

FIG. 570. *The oats and barley producing areas of the world.*

FIG. 571. *The corn-producing areas of the world.*

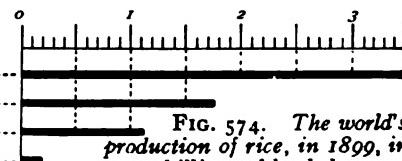
rapidly supplanting rye as a food among the peasants of Europe, and is beginning to be used instead of rice in India, China, and Japan.

FIG. 572. *The world's production of corn, in 1903, in millions of bushels.*

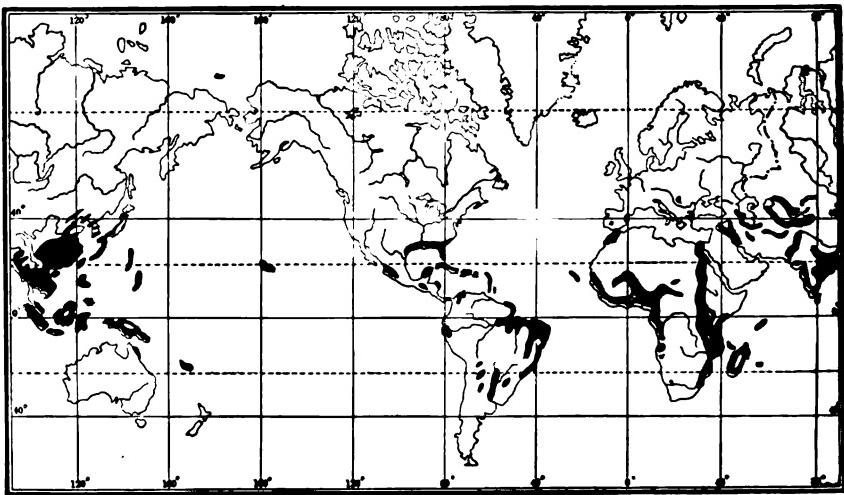
Wheat. Wheat is the most important cereal that enters into the world's trade. Russia and the United States raise more than one-third of the total crop, owing to the vast areas of excellent soil adapted to wheat growing and to the favorable climate. The other wheat-producing nations in the order of their importance are India, France, Austria-Hungary, Italy, Germany, and the Argentine Republic. (See Figs. 567 and 568.) The United States sends to Europe a large part of the wheat and flour which it exports.

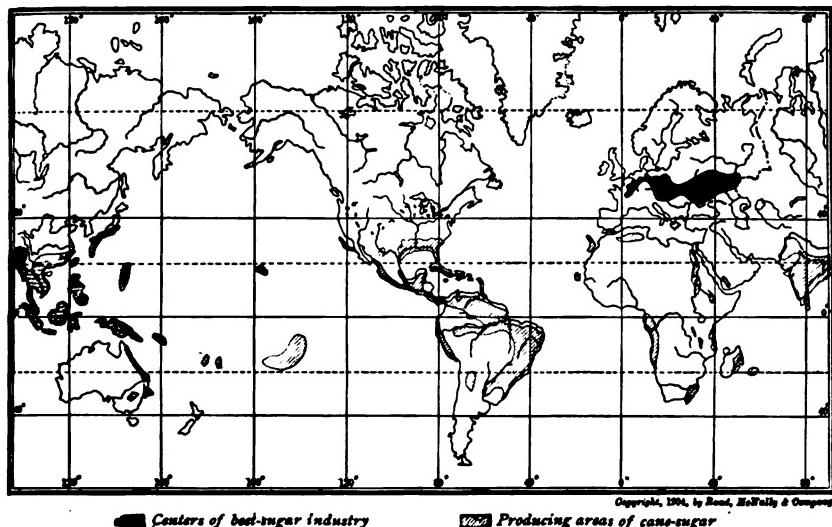
Rye. Rye is the chief food of the peasants of Germany, Russia, and other European countries. It thrives on poor soil which will raise no other grain and will stand a colder climate than wheat. The principal rye-producing countries are Russia and Germany, which together raise about seventy per cent of the world's crop. The production of rye in the United States is relatively unimportant.

Oats. Oats can be grown in the temperate regions where wheat thrives. They are produced as a leading crop farther north than

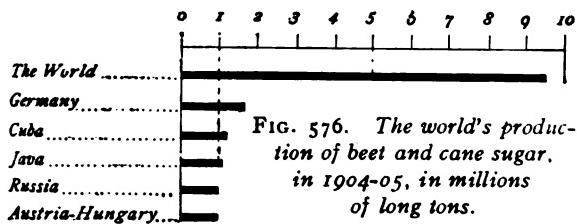
FIG. 574. *The world's production of rice, in 1899, in billions of bushels.*

wheat. Russia leads the world with more than one-fourth of the oat crop. The United States is a close second. Germany and France also have a large share in the world's

FIG. 573. *The rice-producing areas of the world.*

FIG. 575. *The sugar industry of the world.*

production of oats. More than twenty per cent of the oats shipped to Europe each year

FIG. 576. *The world's production of beet and cane sugar, in 1904-05, in millions of long tons.*

are from the United States.

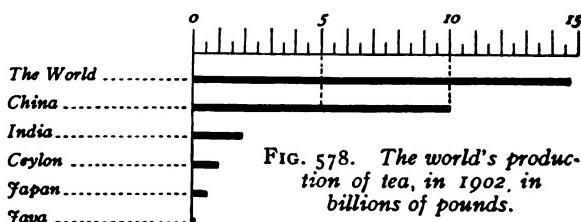
Barley. Barley thrives in a wider range of climate than any other cereal, though it is most successful in a climate similar to that favorable for oats. Practically eighty per cent of the barley of the world is grown in Europe, especially in Russia, Germany, Austria-Hungary, and Spain. (See Figs. 569 and 570.)

Corn. Indian corn is now very widely grown, though it originally was known only in the Americas. The United States produces about

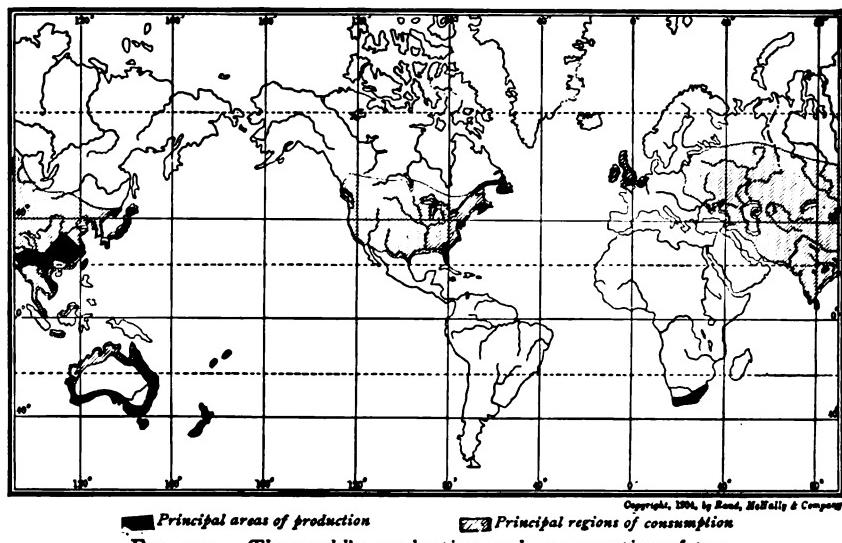
three-fourths of all the corn in the world, Austria-Hungary and Argentine Republic ranking second and third in importance. It is raised in every state in the Union, but is the chief crop of the Northern States of the Mississippi Basin, where the climate is especially favorable. The total value of the corn crop in the United States is greater than that of all the other cereals grown in this country. (See Figs. 571 and 572.)

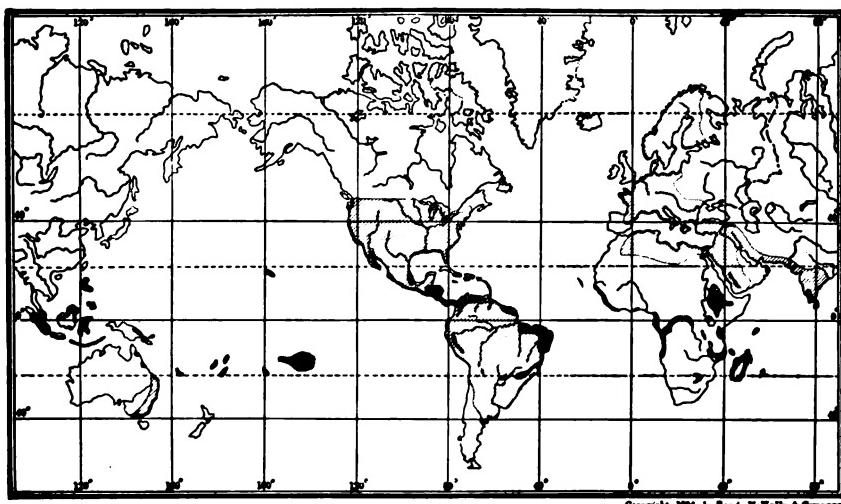
The Leading Crops of the Tropical and Subtropical Countries.

The chief crops of the

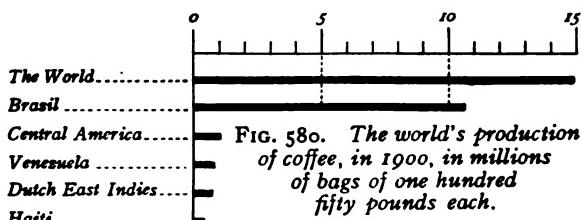
FIG. 578. *The world's production of tea, in 1902, in billions of pounds.*

warm and hot regions of the world are rice, cane sugar, tea, coffee, cocoa, cotton, and

FIG. 577. *The world's production and consumption of tea.*

FIG. 579. *The world's production and consumption of coffee.*

tobacco. Certain of these crops, as, for instance, tobacco and tea, are grown also in



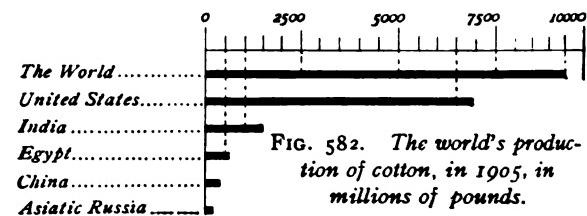
the temperate regions, though they were formerly products of the warmer countries.

Rice. Rice is the chief cereal of the world. It forms the principal food of millions of people of the yellow and brown races. It is, however, not as important commercially as the cereals of the temperate regions because it is used largely in the countries producing it. It is raised in great quantities in China, India, Japan, Indo-China, the Philippines, and Hawaii. The United States produces only about half of the rice needed for home consump-

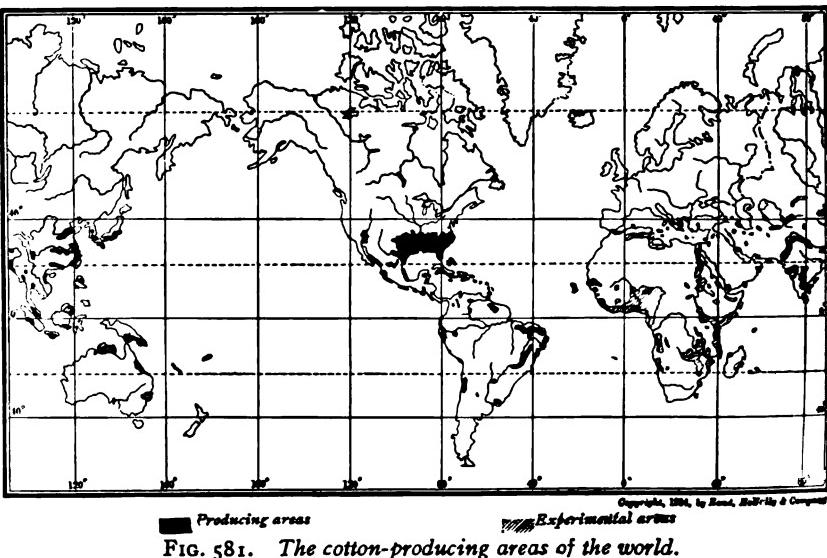
tion, and imports the rest, mostly from Hawaii. (See Figs. 573 and 574.)

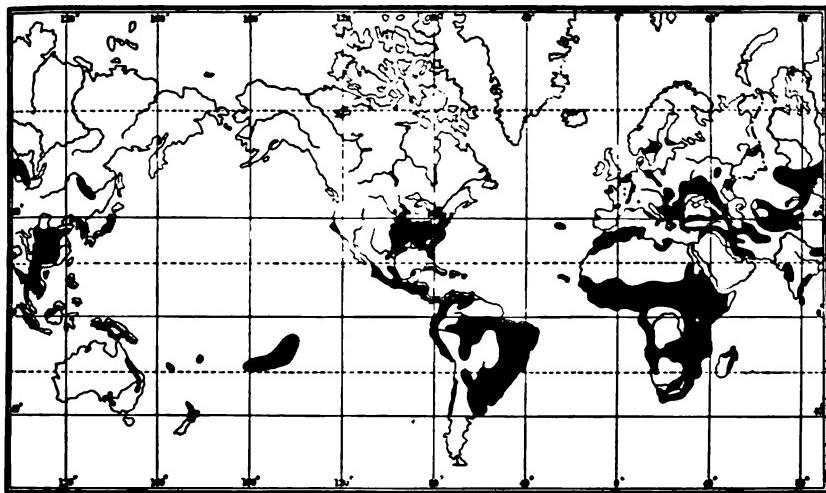
Sugar. The sugar of commerce is either cane sugar or beet sugar, the latter being the most important and slightly outranking cane sugar in amount. Beet sugar is made in abundance in Germany, Russia, Austria-Hungary, and France. The United States imports much of its cane sugar, principally from the West Indies and from Hawaii.

It is the largest import of the United States. (See Figs. 575 and 576.)

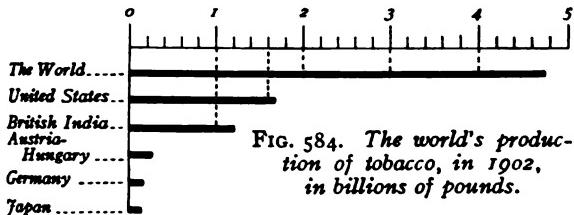


Tea. Tea is raised principally in China, India, Ceylon, and Japan, where the soil and climate are especially favorable. The greatest

FIG. 581. *The cotton-producing areas of the world.*

FIG. 583. *The tobacco-producing areas of the world.*

consumers of tea are the United Kingdom, Russia, and America. (See Figs. 577 and 578.)

FIG. 584. *The world's production of tobacco, in 1902, in billions of pounds.*

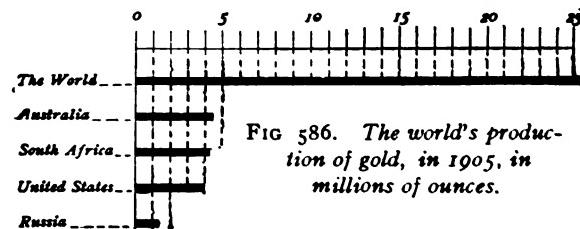
Coffee. Coffee is distinctly a tropical product, and about ninety per cent of the coffee of the world is produced in Brazil, Central America, Venezuela, and Mexico. The United States receives most of its coffee from the American countries, and especially from Brazil. (See Figs. 579 and 580.)

Cotton. Cotton, the most important of the vegetable fibers, is raised in warm, moist, subtropical climates, and especially in the United States, India, China, and Egypt. The United States produces more than seventy per cent of the world's crop,

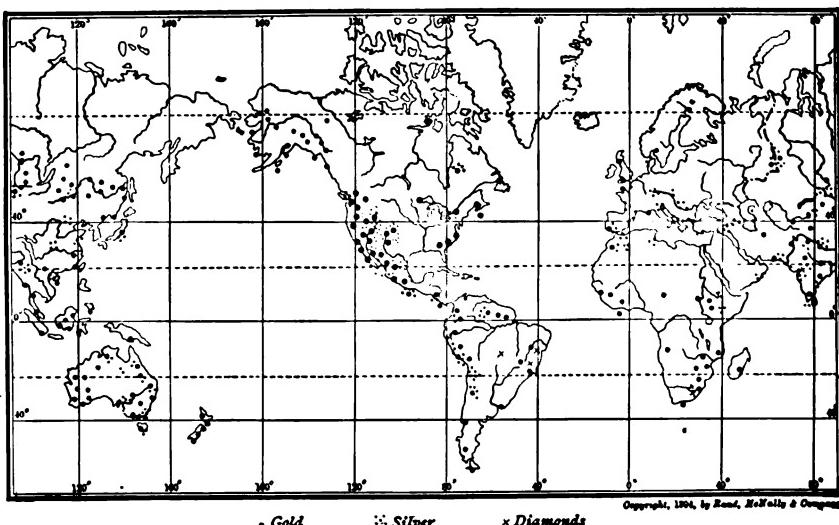
and exports it largely to the cotton mills of the United Kingdom, Germany, and France. (See Figs. 581 and 582.)

Tobacco. Tobacco is grown widely in the temperate and tropical regions. The United States leads the world in production, and also exports more than any other country. The product goes chiefly to Europe, Canada, Australia, Japan, and South Africa.

Gold and Silver. With the exception of Australia, the United States is the greatest

FIG. 586. *The world's production of gold, in 1905, in millions of ounces.*

gold-producing country of the world. In silver production, Mexico alone outranks the United States. (See Figs. 585, 586, and 588.)

FIG. 585. *The distribution of gold, silver, and diamonds.*

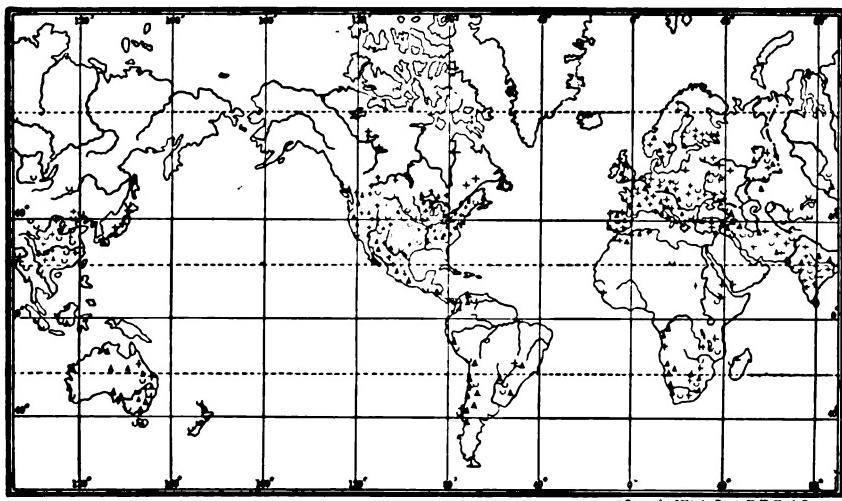


FIG. 587. The distribution of copper, iron, and coal.

Coal and Iron. The raw products already mentioned furnish the chief needs of the

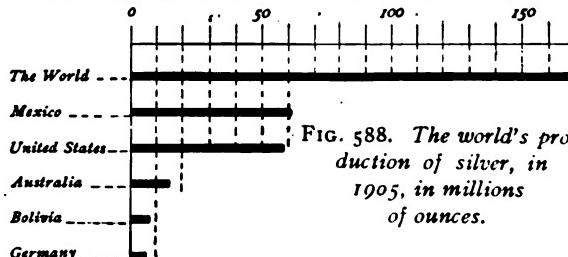


FIG. 588. The world's production of silver, in 1905, in millions of ounces.

manufacturing nations, except for wool, coal, and iron. Many nations with supplies of coal and iron import their food materials largely and devote their attention to manufacturing. The nations with the greatest development of coal and iron mines are the United States, the United Kingdom, and Germany. (See Figs. 587, 590, and 591.)

Manufactures. Owing to the supply of raw materials, coal, and iron, and to the inventiveness of the people, the United States, the United Kingdom, Germany, and France are the leading manufacturing

nations, sending their finished products to all parts of the world. The exports of the United Kingdom and Germany outrank those of the United States, because our country, with its larger population and rapid progress, consumes a greater proportion of its manufactured products, and imports many manufactured products from other countries. (See Fig. 589.)

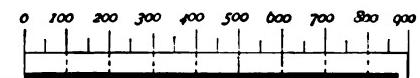


FIG. 590. The world's production of coal, in 1904, in millions of long tons.

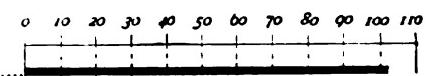


FIG. 591. The world's production of iron in 1903, in millions of tons.

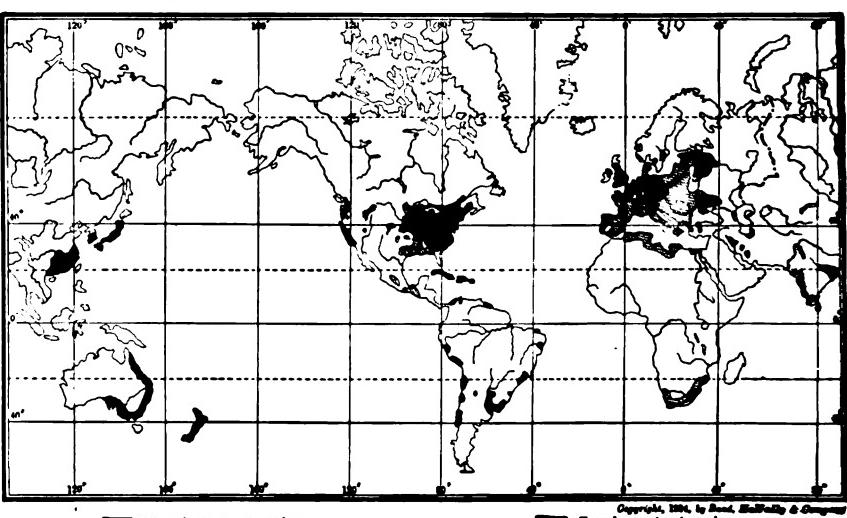


FIG. 589. The principal manufacturing areas of the world.

THE GREAT NATIONS OF THE WORLD

The leading nations of the world in the order of their commercial importance are the United Kingdom, Germany, the United States, the Netherlands, and France. The trade of the United States has already been considered. (See page 182.)

The United Kingdom. The imports of the United Kingdom are mainly from the United States and the British possessions in all parts of the world. They include cereals, provisions, cotton, wool, and lumber. The exports are sent principally to the British Colonies and to the other nations of Europe. They are mainly cotton manufactures and iron and steel goods.

The advantages of the United Kingdom are many. Its geographical position, its climate favorable for continued labor, and its abundant supply of coal, iron, and other raw materials have all led to the development of manufacturing. Its magnificent system of railroads and interior waterways has enabled it to transport its many products to the neighboring seaports at small expense and with little delay. Its extensive colonies, situated in all the climates available for occupation, have given the home country a magnificent market for its products, and have furnished food, raw materials, and tropical products much needed at home.

Germany. The imports of Germany greatly exceed its exports. The principal trade is with the United States, the United Kingdom, Austria-Hungary, and the Netherlands. Germany receives from the United States food products and cotton.

Germany has many natural advantages. Its great mineral resources have been extensively developed so that iron is available for manufacturing. The people have employed modern manufacturing processes and have adopted the most modern business methods. The great development of railroads and canals has brought every manufacturing town into ready touch with the ports.

France. The imports of France are chiefly wool, raw silk, coal, cotton, and grain, of which about one-eighth in total value comes from the United States. Its exports are mainly silk and woolen manufactures and wine, of which the United Kingdom, Belgium, and Germany receive the greater part.

The advantages of France are mainly due to its varied surface, which allows for a variety of industries, and to a climate which favors the growing of silkworms and the raising of grapes. Manufacturing has developed because of the abundance of raw materials and the inventiveness of the people. France has also been favored by its position on the Atlantic and the Mediterranean, and by its system of navigable rivers and canals, which give access to the manufacturing regions.

The Netherlands. As the Netherlands owns the most valuable islands of the East Indies, its colonies rank next to those of the United Kingdom in importance. From these tropical regions it receives products of great value, needed by other countries. These include drugs, and Peruvian bark. The imports are chiefly from Germany, the United Kingdom, the East Indies, and the United States. More than one-half of the exports are sent to Germany; the exports to the United States are insignificant in quantity. Owing to the position of the Netherlands on the coast and to its fine harbors, it receives a vast quantity of goods on their way to the other countries of continental Europe.

Exercises

- (1) Select three of the staple food products of the world and write a composition about each under the following headings: (a) Value of product as food; (b) Conditions of climate and surface favorable to its growth; (c) Countries producing it and cities exporting it; (d) Part played by the United States in producing and consuming it. (2) Make a list of the chief tobacco-producing countries. (3) Locate a manufacturing city in each of the leading manufacturing countries.

SUGGESTIONS FOR COLLATERAL READING

The few suggestions for collateral reading given below have been selected with care so as to present only that which is best. No attempt has been made to prepare a list which shall contain all that is available and trustworthy. Such a list would have little practical value for teachers unless a large library were available. The references are given by chapters for convenience in use.

KEY TO ABBREVIATIONS

American Book Company (A. B. C.); D. Appleton & Company (Ap.); A. & C. Black (Bl.); Cassell Publishing Company (C.); The Century Company (Cen.); Ginn & Company (G.); D. C. Heath & Company (H.); Longmans, Green & Company (L. G.); The Macmillan Company (Mac.); Charles Scribner's Sons (S.); Sibley & Company (Si.); Silver, Burdett & Company (S. B. C.).

II. Page 10.

Ball's *Star Land* (C.), The Sun, pp. 1-69.
Jackson's *Astronomical Geography* (H.), Spherical Form of the Earth, Departure from the Spherical Form, pp. 1-9; Dimensions and Distances, pp. 16-21.
Geikie's *Physical Geography*, *Science Primer No. IV.* (Ap.), The Shape of the Earth, pp. 8-12.
Geikie's *Elementary Lessons in Physical Geography* (Mac.), The Earth's Form, pp. 3-11.

III. Page 12.

Jackson's *Astronomical Geography* (H.), Latitude and Longitude, pp. 9-13; The Earth's Daily Motion, pp. 28-39; The Inclination of the Earth's Axis, pp. 50-65.
Ball's *Star Land* (C.), The Sun, pp. 44-52.
Geikie's *Physical Geography*, *Science Primer No. IV.* (Ap.), Day and Night, pp. 13-16.
Geikie's *Elementary Lessons in Physical Geography* (Mac.), The Earth's Motions, pp. 11-12.

IV. Page 16.

Jackson's *Astronomical Geography* (H.), Zones, pp. 13-15; The Sun's Rays and the Earth's Atmosphere, pp. 21-28; The Earth's Yearly Motion, pp. 39-49.
Ball's *Star Land* (C.), The Sun, pp. 52-69.
Geikie's *Elementary Lessons in Physical Geography* (Mac.), The Earth's Motion, pp. 12-17.

V. Page 21.

Dodge's *A Reader in Physical Geography* (L. G.), The World as a Whole, pp. 1-9; The Larger Features of the Continents, pp. 10-27.
Shaler's *First Book in Geology* (H.), Changes in the Shape of Land and Sea, pp. 141-145.
Geikie's *Physical Geography*, *Science Primer No. IV.* (Ap.), The Sea, pp. 86-90.
Geikie's *Elementary Lessons in Physical Geography* (Mac.), A General View of the Earth, pp. 32-36; Continents and Islands, pp. 162-173.
Ingersoll's *The Book of the Ocean* (Cen.), The Ocean and Its Origin, pp. 1-7.

VI. and VII. Pages 24-34.

Dodge's *A Reader in Physical Geography* (L. G.), The Work of Running Water, pp. 81-99; The Work of Standing Water, pp. 113-116.

Buckley's *The Fairy-land of Science* (Ap.), The Two Great Sculptors, pp. 103-121.

Shaler's *First Book in Geology* (H.), Origin of Valleys and Lakes, pp. 113-129.

Geikie's *Physical Geography*, *Science Primer No. IV.* (Ap.), The Circulation of Water on the Land, pp. 39-42; Brooks and Rivers, pp. 62-75.

Geikie's *Elementary Lessons in Physical Geography* (Mac.), Running Water, pp. 244-258; Lakes, pp. 258-269; The Work of Running Water, pp. 272-293.

VIII. Page 34.

Dodge's *A Reader in Physical Geography* (L. G.), Plains and Plateaus, pp. 137-143; Mountains, pp. 144-153.

Shaler's *First Book in Geology* (H.), Hills, Mountains, Valleys, and Continents, pp. 107-112.

Geikie's *Elementary Lessons in Physical Geography* (Mac.), The Relief of the Land, pp. 173-182.

IX. Page 37.

Dodge's *A Reader in Physical Geography* (L. G.), Water Supply, pp. 206-212.

Shaler's *First Book in Geology* (H.), Course of Water Underground, pp. 74-87.

Geikie's *Physical Geography*, *Science Primer No. IV.* (Ap.), How Springs Are Formed, pp. 42-47; The Work of Water Underground, pp. 47-51.

Geikie's *Elementary Lessons in Physical Geography* (Mac.), Springs and Underground Rivers, pp. 222-232.

X. Page 39.

Dodge's *A Reader in Physical Geography* (L. G.), Volcanoes, pp. 154-164.

Shaler's *First Book in Geology* (H.), Volcanoes, pp. 88-97; Earthquakes, pp. 130-140.

Geikie's *Physical Geography*, *Science Primer No. IV.* (Ap.), The Inside of the Earth, pp. 102-109.

Geikie's *Elementary Lessons in Physical Geography* (Mac.), Volcanoes, pp. 196-210; Movements of the Land, pp. 210-216.

XI. Page 42.

Dodge's *A Reader in Physical Geography* (L. G.), What is Weather and Climate, pp. 171-175; Temperature, pp. 176-184; Climate of the World, pp. 194-197.

Buckley's *The Fairy-land of Science* (Ap.), The Aerial Ocean in Which We Live, pp. 53-64.

Shaler's *First Book in Geology* (H.), The Air, pp. 56-61.

Geikie's *Physical Geography*, *Science Primer No. IV.* (Ap.), The Air, pp. 38-47; The Temperature of the Air, pp. 54-64; How the Surface of the Earth Crumbles Away, pp. 51-62.

Gaye's *The Great World's Farm* (Mac.), Pioneer Laborers, pp. 15-28; Soil Makers, pp. 29-40; Soil Carriers, pp. 41-49; Soil Binders, pp. 50-59; Field Laborers, pp. 60-89.

XII. Page 46.

Dodge's *A Reader in Physical Geography* (L. G.), Winds and Rainfall, pp. 185-188.

Buckley's *The Fairy-land of Science* (Ap.), The Aerial Ocean, pp. 64-75.

Geikie's *Physical Geography, Science Primer No. IV.* (Ap.), Wind, pp. 24-27.

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REFERENCE TABLES

Areas of the Oceans

(Estimated by Ravenstein)

	AREA IN SQUARE MILES
Arctic	5,285,000
Antarctic	5,731,350
Indian	28,015,600
Atlantic	34,401,400
Pacific	67,099,630

Areas and Populations of the Continents

(From Supan's *Die Bevölkerung der Erde*)

	AREA IN SQUARE MILES	POPULA- TION
Australia	3,455,483	6,483,000
Europe	3,753,310	392,264,000
South America	6,840,531	38,482,000
North America	8,035,632	105,714,000
Africa	11,510,597	140,700,000
Asia	17,053,248	819,556,000

Areas and Populations of the Principal Countries

(Largely based on *Statesman's Year Book*, 1904)

	AREA IN SQUARE MILES	POPULA- TION
Afghanistan	215,400	4,500,000
Alaska (U. S.)	590,884	63,502
Algeria (Fr.)	184,474	4,730,556
Argentine Republic	1,135,840	3,954,911
Australia, Commonwealth of (Brit.)	2,072,573	3,771,715
New South Wales	310,700	1,354,840
Queensland	668,497	496,506
South Australia	903,600	362,604
Tasmania	26,215	172,475
Victoria	87,884	1,201,070
West Australia	975,020	184,124
Austria-Hungary	241,403	45,405,207
Barbados (Brit.)	166	195,588
Belgium	11,373	6,603,548
Bolivia	703,400	1,810,300
Brazil	3,218,130	14,333,915
Bulgaria (Turk.)	38,080	3,744,283
Canada, Dominion of (Brit.)	3,745,574	5,371,315
Cape of Good Hope (Brit.)	276,095	2,433,000
Ceylon (Brit.)	25,332	3,578,333
Chile	307,020	2,712,145
China	1,533,420	407,337,305
Colombia	473,202	3,593,000
Congo Ind'p't State	900,000	30,000,000
Costa Rica	18,400	243,205
Cuba	44,000	1,572,845
Denmark and Faroe Islands	15,388	2,464,770
East Indies (Dutch)	7,36,400	30,000,000
Ecuador	116,000	1,400,000
Egypt (excluding desert)	12,076	9,734,405
France	207,054	38,961,045
Germany	208,830	56,167,173
Greece and Crete	28,340	2,737,350
Guatemala	48,200	1,647,300
Guiana (Brit.)	100,000	203,058
Haiti	10,204	1,204,400
Hawaii (U. S.)	6,440	154,001
India (Brit.)	1,087,249	231,890,507
Indo-China (French)	255,000	18,234,500
Italy	110,059	32,475,253
Jamaica (Brit.)	4,373	771,553
Japan with Formosa	161,108	47,018,705
Korea	82,000	12,000,000
Malay States (Brit.)	26,000	735,000
Martinique (French)	380	203,781
Mauritius (Brit.)	729	375,872
Mexico	767,005	13,605,010
Morocco	219,000	5,000,000
Natal (Brit.)	36,170	925,118
Netherlands	12,648	5,347,182
Newfoundland (Brit.)	162,734	220,249
New Zealand (Brit.)	104,471	772,710

REFERENCE TABLES

Oceanic Possession of the United States

(From Government census and other official reports)

	GROSS AREA SQUARE MILES	POPULA- TION
Guam (estimated)	224	9,000
Hawaii	6,440	154,001
Porto Rico	3,000	953,243
Tutuila, Samoa Islands (est.)	84	5,800
Philippines,) land (U. S. The water	115,026 { 717,042	7,635,426 { 18,000

Twenty-five Largest Cities in the United States

(Twelfth Census of the United States, Vol. II, p. 302.)

	POPULATION
1. New York, N. Y.	3,437,202
2. Chicago, Ill.	1,698,575
3. Philadelphia, Pa.	1,293,697
4. St. Louis, Mo.	575,238
5. Boston, Mass.	560,802
6. Baltimore, Md.	508,057
7. Cleveland, Ohio.	381,768
8. Buffalo, N. Y.	352,387
9. San Francisco, Cal.	342,782
10. Cincinnati, Ohio.	325,002
11. Pittsburgh, Pa.	321,616
12. New Orleans, La.	287,104
13. Detroit, Mich.	285,704
14. Milwaukee, Wis.	283,315
15. Washington, D. C.	278,718
16. Newark, N. J.	240,070
17. Jersey City, N. J.	200,433
18. Louisville, Ky.	204,731
19. Minneapolis, Minn.	202,718
20. Providence, R. I.	175,597
21. Indianapolis, Ind.	161,164
22. Kansas City, Mo.	163,752
23. St. Paul, Minn.	163,065
24. Rochester, N. Y.	162,608
25. Denver, Colo.	133,859

Some Important Cities of the United States

(Twelfth Census of the United States, Vol. I, p. 438.)

	POPULATION
1. Albany, N. Y.	94,151
2. Albuquerque, N. Mex.	6,218
3. Annapolis, Md.	8,525
4. Ardmore, Ind.	5,081
5. Asheville, N. C.	14,004
6. Atchison, Kans.	15,722
7. Atlanta, Ga.	89,872
8. Augusta, Ga.	39,441
9. Augusta, Me.	11,683
10. Austin, Tex.	22,258
11. Baltimore, Md.	508,057
12. Baton Rouge, La.	11,209
13. Bellingham, Wash.	11,062
14. Binghamton, N. Y.	30,047
15. Birmingham, Ala.	38,415
16. Bismarck, N. Dak.	3,319
17. Boise, Idaho.	5,957
18. Boston, Mass.	560,892
19. Buffalo, N. Y.	352,187
20. Burlington, Vt.	18,640
21. Butte, Mont.	30,470
22. Calais, Me.	7,055
23. Cairo, Ill.	12,566
24. Carson City, Nev.	2,100
25. Charleston, S. C.	55,807
26. Charleston, W. Va.	11,099
27. Chattanooga, Tenn.	30,154
28. Cheyenne, Wyo.	14,057
29. Chicago, Ill.	1,698,575
30. Cincinnati, Ohio.	325,002
31. Cleveland, Ohio.	381,768
32. Colorado Springs, Col.	21,055
33. Columbia, S. C.	21,108
34. Columbus, Ohio.	125,500
35. Concord, N. H.	10,632
36. Covington, Ky.	42,938

REFERENCE TABLES

Some Important Cities of the United States—Continued

	POPULATION
37. Council Bluffs, Iowa	25,802
38. Cripple Creek, Colo.	16,147
39. Cumberland, Md.	17,128
40. Dallas, Tex.	42,638
41. Davenport, Iowa	35,254
42. Denver, Colo.	133,859
43. Des Moines, Iowa	62,139
44. Detroit, Mich.	285,704
45. Dover, Del.	3,320
46. Dubuque, Iowa	36,297
47. Duluth, Minn.	57,069
48. East St. Louis, Ill.	29,655
49. El Paso, Tex.	15,006
50. Erie, Pa.	54,733
51. Evansville, Ind.	59,007
52. Everett, Wash.	7,838
53. Fargo, N. Dak.	9,589
54. Fort Smith, Ark.	11,587
55. Fort Wayne, Ind.	45,115
56. Port Worth, Tex.	26,688
57. Frankfort, Ky.	9,487
58. Galveston, Tex.	37,789
59. Grand Forks, N. Dak.	7,652
60. Grand Island, Nebr.	7,554
61. Grand Rapids, Mich.	87,565
62. Great Falls, Mont.	14,030
63. Guthrie, Okla.	10,006
64. Harrisburg, Pa.	50,167
65. Hartford, Conn.	70,850
66. Helena, Mont.	10,770
67. Hot Springs, Ark.	9,973
68. Houston, Tex.	44,633
69. Indianapolis, Ind.	100,104
70. Jackson, Miss.	7,816
71. Jacksonville, Fla.	28,429
72. Jefferson City, Mo.	9,664
73. Jersey City, N. J.	206,433
74. Kansas City, Kans.	51,418
75. Kansas City, Mo.	163,752
76. Key West, Fla.	17,114
77. Knoxville, Tenn.	34,637
78. La Crosse, Wis.	28,895
79. Lansing, Mich.	16,485
80. Laramie, Wyo.	8,207
81. Laredo, Tex.	13,429
82. Las Vegas, N. Mex.	3,552
83. Lead, S. Dak.	6,210
84. Leadville, Colo.	12,455
85. Leavenworth, Kans.	20,735
86. Lexington, Ky.	26,360
87. Lincoln, Nebr.	40,160
88. Little Rock, Ark.	38,307
89. Los Angeles, Cal.	104,470
90. Louisville, Ky.	204,731
91. Madison, Wis.	19,164
92. Manchester, N. H.	56,087
93. Memphis, Tenn.	102,320
94. Meridian, Miss.	14,050
95. Miles City, Mont.	1,938
96. Milwaukee, Wis.	285,315
97. Minneapolis, Minn.	202,718
98. Mobile, Ala.	38,460
99. Montgomery, Ala.	30,340
100. Montpelier, Vt.	6,260
101. Muscogee, Ind. T.	4,254
102. Nashville, Tenn.	80,865
103. Newark, N. J.	246,070
104. New Haven, Conn.	108,027
105. New Orleans, La.	287,104
106. New York, N. Y.	3,437,202
107. Norfolk, Va.	46,624
108. Oakland, Cal.	66,960
109. Ogden, Utah	16,313
110. Oklahoma, Okla.	10,037
111. Olympia, Wash.	3,863
112. Omaha, Nebr.	102,555
113. Parkersburg, W. Va.	11,703
114. Pawtucket, R. I.	39,231
115. Pensacola, Fla.	17,747
116. Peoria, Ill.	56,100
117. Petersburg, Va.	21,810
118. Philadelphia, Pa.	1,293,607
119. Phoenix, Ariz.	5,544
120. Pierre, S. Dak.	2,306
121. Pine Bluff, Ark.	11,406
122. Pittsburgh, Pa.	321,616
123. Pocatello, Idaho	4,046
124. Portland, Me.	50,145
125. Portland, Oregon	90,426
126. Portsmouth, N. H.	10,037
127. Prescott, Ariz.	3,559
128. Providence, R. I.	175,597

Other large Cities of the World

(Largely based on the *Statesman's Year Book*, 1904)

	POPULATION
1. Acapulco, Mexico	4,032
2. Aïlen, Arabia	41,222
3. Alexandria, Egypt	310,766
4. Algiers, Algeria	96,542
5. Antananarivo, Madagascar (est.)	55,000

	POPULATION
6. Antwerp, Belgium	278,093
7. Asuncion, Paraguay	51,700
8. Athens, Greece	34,213
9. Auckland, New Zealand	174,412
10. Bahia, Brazil	350,000
11. Bangkok, Siam (est.)	53,000
12. Barcelona, Spain	40,000
13. Barranquilla, Colombia (est.)	111,000
14. Basel, Switzerland	115,887
15. Batavia, Java	118,800
16. Beirut, Syria (est.)	349,180
17. Belfast, Ireland	69,097
18. Belgrade, Servia	209,331
19. Benares, India	72,251
20. Bergen, Norway	64,864
21. Bern, Switzerland	55,362
22. Besançon, France	522,204
23. Birmingham, England	120,000
24. Bogotá, Colombia (est.)	152,000
25. Bologna, Italy	257,638
26. Bordeaux, France	163,297
27. Bremen, Germany	328,045
28. Bristol, England	100,346
29. Brünn, Austria-Hungary	76,303
30. Brusa, Turkey	562,893
31. Brussels (inc. suburbs), Belgium	282,071
32. Bukarest, Roumania	570,062
33. Cairo, Egypt	50,743
34. Calais, France	16,000
35. Callao, Peru (est.)	24,537
36. Candia, Crete	30,420
37. Cannes, France	28,048
38. Cape Coast Castle, W. Africa	51,251
39. Cape Town, Cape of Good Hope	72,429
40. Caracas, Venezuela	164,333
41. Cardiff, Wales	42,097
42. Carrara, Italy	227,626
43. Christiania, Norway	372,549
44. Cologne, Germany	158,228
45. Colombo, Ceylon	3,000
46. Colon, Panama	378,235
47. Copenhagen, Denmark	225,000
48. Damascus, Syria (est.)	31,515
49. Damietta, Egypt	140,563
50. Danzig, Germany	390,146
51. Dresden, Germany	290,638
52. Dublin, Ireland	60,446
53. Durban, Natal	327,441
54. Edinburgh, Scotland	118,862
55. Essen, Germany	140,000
56. Fez, Morocco (est.)	205,589
57. Florence, Italy	105,139
58. Geneva, Switzerland	234,710
59. Genoa, Italy	162,291
60. Ghent, Belgium	133,625
61. Gothenburg, Sweden	138,080
62. Graz, Austria-Hungary	51,000
63. Guayaquil, Ecuador	40,832
64. Halifax, Canada	3,000
65. Hammerfest, Norway	150,000
66. Hanoi, Indo-China (est.)	235,649
67. Hanover, Germany	275,000
68. Havana, Cuba	24,655
69. Hobart, Australia	181,918
70. Hong-kong, China (Brit.)	30,305
71. Honolulu, Hawaii	42,498
72. Iquique, Chile (est.)	51,434
73. Irkutsk, Asiatic Russia	21,304
74. Jaffa, Syria	42,000
75. Jerusalem, Syria (est.)	102,078
76. Johannesburg, The Transvaal	1,864
77. Juneau, Alaska	107,977
78. Kiel, Germany	28,718
79. Kimberley, Cape of Good Hope	46,542
80. Kingston, Jamaica	60,000
81. La Paz, Bolivia	428,668
82. Leeds, England	98,321
83. Leghorn, Italy	130,196
84. Le Havre, France	456,124
85. Leipzig, Germany	10,000
86. Lhasa, Tibet (est.)	210,666
87. Lille, France	100,000
88. Lima, Peru (est.)	356,000
89. Lisbon, Portugal	14,000
90. Loanda, Angola	351,570
91. Lodz, Russia	6,370
92. Lourenço Marques, E. Africa (Port.)	459,099
93. Lyons, France	509,346
94. Madras, India	510,835
95. Madrid, Spain	130,100
96. Malaga, Spain	38,720
97. Manaus, Brazil	543,872
98. Manchester, England	302,154
99. Manila, The Philippines (est.)	

REFERENCE TABLES

**Other Large Cities of the World—
Continued**

	POPULATION
100. Manzanillo, Mexico	2,000
101. Maracaibo, Venezuela	34,284
102. Marseilles, France	401,101
103. Mazatlan, Mexico	17,852
104. Mecca, Arabia (est.)	60,000
105. Mekines, Morocco (est.)	10,000
106. Melbourne, Australia	400,079
107. Mentone, France	9,044
108. Mexico, Mexico	344,721
109. Milan, Italy	401,460
110. Montevideo, Uruguay	139,860
111. Montreal, Canada	207,710
112. Morocco, Morocco (est.)	60,000
113. Mukden, China	150,000
114. Naples, Italy	503,540
115. Nice, France	105,100
116. Nome, Alaska	12,488
117. Odessa, Russia	405,041
118. Oporto, Portugal	167,055
119. Ottawa, Canada	59,028
120. Pago Pago, Tutuila (est.)	500
121. Panama, Panama	28,000
122. Para, Brazil	50,064
123. Pavia, Italy	35,447
124. Pernambuco, Brazil	111,556
125. Ponce, Porto Rico	27,952
126. Port Elizabeth, Cape of Good Hope	23,266
127. Port Said, Egypt	42,095
128. Prague, Austria-Hungary	201,580
129. Pretoria, The Transvaal	14,014
130. Punta Arenas, Chile	3,227
131. Quebec, Canada	68,840
132. Queenstown, Ireland	9,082
133. Rejkjavik, Iceland	6,682
134. Riga, Russia	282,043
135. Rochelle, France	31,550
136. Rome, Italy	402,783
137. Rosetta, Egypt	14,414
138. Rouen, France	116,316
139. St. Etienne, France	146,550
140. St. Gall, Switzerland	33,363
141. Salonic, Turkey	105,000
142. San Juan, Porto Rico	32,048
143. Santiago, Chile (est.)	206,695
144. Santiago, Cuba	43,090
145. Sebastopol, Russia	50,710
146. Sheffield, England	380,793
147. Singapore, Straits Settlements	162,547
148. Sitka, Alaska	1,390
149. Soul, Korea	196,640
150. Southampton, England	104,824
151. Stuttgart, Germany	210,702
152. Stockholm, Sweden	305,810
153. Strassburg, Germany	151,041
154. Suez, Egypt	17,173
155. Tamatave, Madagascar (est.)	11,000
156. Tampico, Mexico	16,313
157. Tashkend, Asiatic Russia	156,414
158. Tiflis, Asiatic Russia	100,645
159. Tomsk, Asiatic Russia	63,533
160. Toronto, Canada	208,040
161. Tripoli, Tripoli (est.)	30,000
162. Tunis, Tunis (est.)	170,000
163. Valencia, Spain	213,530
164. Valencia, Venezuela	38,054
165. Valparaiso, Chile (est.)	132,041
166. Vancouver, Canada	26,133
167. Venice, Italy	151,840
168. Vera Cruz, Mexico	20,164
169. Victoria, Hong-kong	181,018
170. Vladivostok, Asiatic Russia	38,000
171. Wellington, New Zealand	43,038
172. Winnipeg, Canada	42,340
173. Yokohama, Japan	103,762
174. Zurich, Switzerland	152,042

**Principal Rivers of the World
NORTH AMERICA**

	APPROXIMATE LENGTH IN MILES	APPROXIMATE AREA DRAINED, IN SQUARE MILES
Missouri-Mississippi	4,104	1,238,642
Yukon	2,050	440,000
Colorado	2,000	225,040
Rio Grande	1,800	145,200
Saskatchewan-Nelson	1,450	300,000
Columbia	1,400	210,517
Athabaska-Mackenzie	1,100	677,000
St. Lawrence	1,034	297,000

REFERENCE TABLES

SOUTH AMERICA

	APPROXIMATE LENGTH IN MILES	APPROXIMATE AREA DRAINED, IN SQUARE MILES
Amazon	3,300	2,500,000
Parana-La Plata	2,050	1,200,000
Sao Francisco	1,800	307,600
Orinoco	1,550	365,000

EUROPE

	APPROXIMATE LENGTH IN MILES	APPROXIMATE AREA DRAINED, IN SQUARE MILES
Volga	2,325	563,300
Danube	1,800	315,000
Dnieper	1,334	202,200
Don	1,153	166,130
Dvina	1,100	134,000
Dniester	853	16,510
Rhine	810	86,600
Elbe	720	55,340
Vistula	652	73,000
Tagus	566	31,864
Olier	552	43,300
Loire	543	40,750
Rhone	504	38,000
Seine	425	30,028
Po	418	26,800

ASIA

	APPROXIMATE LENGTH IN MILES	APPROXIMATE AREA DRAINED, IN SQUARE MILES
Ob	3,235	1,150,870
Yangtse-kiang	3,000	700,000
Lena	2,800	908,080
Amur	2,700	787,000
Mekong	2,600	350,000
Yenesei	2,500	702,300
Hwang-ho	2,100	387,150
Indus	2,000	360,150
Brahmaputra	1,800	300,000
Ganges	1,455	397,300

AFRICA

	APPROXIMATE LENGTH IN MILES	APPROXIMATE AREA DRAINED, IN SQUARE MILES
Nile	3,670	1,620,000
Congo	2,800	1,000,000
Niger	2,600	780,000
Zambezi	1,600	550,000

AUSTRALIA

	APPROXIMATE LENGTH IN MILES	APPROXIMATE AREA DRAINED, IN SQUARE MILES
Darling	1,160	108,000
Murray	1,100	270,000

Some of the Large Lakes of the World
(Based on Longman's Gazetteer of the World)
NORTH AMERICA

	AREA IN SQ. MILES	ALTITUDE IN FEET
Superior	31,200	602
Huron	23,800	581
Michigan	22,450	581
Great Bear	14,000	391
Erie	9,060	572
Ontario	7,240	246
Great Slave	7,100	520
Nicaragua	2,075	106
Great Salt ²	2,000	4,218

SOUTH AMERICA

	AREA IN SQ. MILES	ALTITUDE IN FEET
Titicaca	3,261	12,500

EUROPE

	AREA IN SQ. MILES	ALTITUDE IN FEET
Ladoga	7,000	55

² Salt.**ASIA**

	AREA IN SQ. MILES	ALTITUDE IN FEET
Caspian Sea ³	160,383	86 ¹
Aral Sea ²	26,100	158
Baikal	13,197	1,400
Dead Sea ²	353	1,290 ¹

Principal Mountains of the World
NORTH AMERICA

	WHERE LOCATED	HEIGHT IN FEET
Mt. McKinley	Alaska	20,464
Mt. Logan	Canada	19,539
Orizaba	Mexico	18,314
Mt. St. Elias	Alaska-Yukon Frontier	18,024

	WHERE LOCATED	HEIGHT IN FEET
Popocatepetl	Mexico	17,550
Wrangell	Alaska	17,500
Mt. Whitney	California	14,808
Mt. Rainier	Washington	14,526
Massive Mountain	Colorado	14,424
Mt. Shasta	California	14,380
Longs Peak	Colorado	14,271
Pikes Peak	Colorado	14,108
Fremont Peak	Wyoming	13,700
Mt. Hood	Oregon	11,225

SOUTH AMERICA

	WHERE LOCATED	HEIGHT IN FEET
Aconcagua	Argentine Rep.	22,860
Chimborazo	Ecuador	20,498
Misti	Peru	20,320
Cotopaxi	Ecuador	19,480
Tolima, Nevado de Colombia	Colombia	18,300

	WHERE LOCATED	HEIGHT IN FEET
Mont Blanc	France	15,780
Monte Rosa	Italian Frontier	15,215
Mulahacen	Sierra Nevada	11,781
Pic de Nethou	Spain	11,170
Mt. Etna	Italy	10,865
Mt. Hecla	Iceland	5,006
Mt. Vesuvius	Italy	4,260

ASIA

	WHERE LOCATED	HEIGHT IN FEET
Mt. Everest	Himalayas	29,002
Depsang	Karakoram	28,280
Kanchanjang ⁴	Himalayas	28,156
Mustagh-ata	Pamirs	24,500
Elbruz	Russia	18,525
Demavend	Persia	18,500
Ararat	Armenia	17,260
Fujiyama	Japan	12,440
Mt. Hermon	Syria	11,000

AFRICA

	WHERE LOCATED	HEIGHT IN FEET
Kilima-njaro	Ger. E. Africa	19,300
Mt. Kenia	Brit. E. Africa	19,270
Mt. Ruwenzori	Brit. E. Africa	16,000
Ras Dashan	Abyssinia	15,000
Tizi Tamjurt	Morocco	14,500
Kamerun Mts.	Kamerun	13,000
Mont aux Sources	South Africa (Natal Frontier)	10,000

OCEANIA

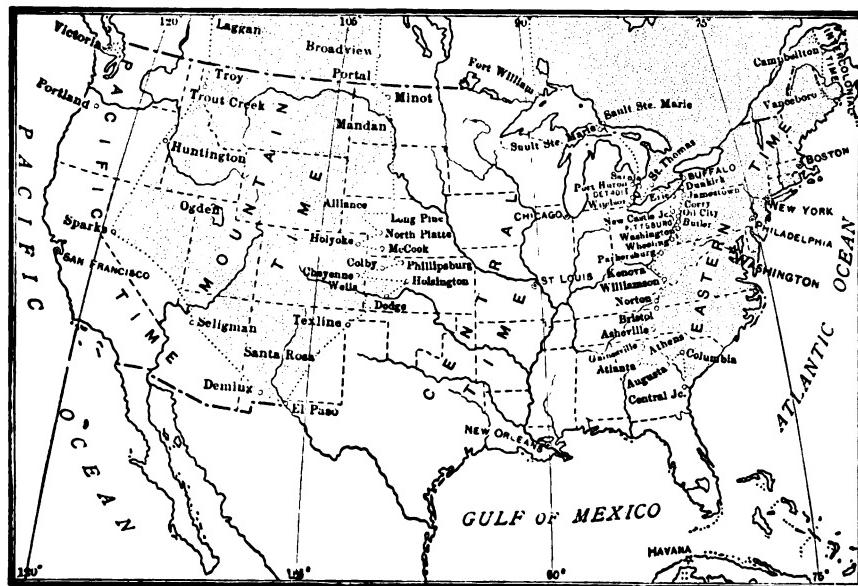
	WHERE LOCATED	HEIGHT IN FEET
Kinabalu	Borneo	13,700
Mauna Loa	Hawaiian Islands	13,600
Owen Stanley	New Guinea	13,200
Mt. Cook	New Zealand	12,350

REFERENCE TABLES

X

Length of Railroads in the Different Countries—Continued

COUNTRIES	LENGTH IN MILES
United States.....	193,304
German Empire.....	31,933
Russia.....	29,892
France.....	26,611
India.....	23,758
Austria-Hungary.....	22,917
United Kingdom.....	21,864
Dominion of Canada.....	17,831
Argentine Republic.....	10,171
Italy.....	9,810
Brazil.....	9,105
Mexico.....	9,055
Spain.....	8,300
Sweden.....	7,034
Belgium.....	3,943
Siberia.....	3,852
Japan.....	3,601
Cape Colony.....	2,937
Chile.....	2,850
Algiers and Tunis.....	2,642
Switzerland.....	2,351
Mauritius, Reunion, etc.....	2,298
New Zealand.....	2,280
Egypt.....	2,087
Netherlands.....	1,904
Turkey in Europe.....	1,952
Roumania.....	1,925
Denmark.....	1,863
Asia Minor and Syria.....	1,715
Portugal.....	1,476
Dutch East Indies.....	1,301
Norway.....	1,286
The Transvaal.....	1,203
Uruguay.....	1,144
Cuba.....	1,134
Peru.....	1,036
Natal.....	737
Central America.....	718
Jamaica.....	637
Newfoundland.....	641
Venezuela.....	634
Bolivia.....	621
Greece.....	605
Orange River Colony.....	597
Tasmania.....	470
China.....	401
Servia.....	350



A map showing the standard time belts in the United States and Canada

Some Ocean Trade Routes of the World

(From Bartholomew's Twentieth Century Citizens' Atlas of the World)

POINT OF DEPARTURE	DESTINATION	DISTANCE IN MILES	APPROXIMATE TIME IN DAYS
Alexandria.....	London.....	2,275	6
Alexandria.....	Liverpool.....	3,027	14
Algiers.....	Liverpool.....	1,665	8
Apia (Samoa).....	San Francisco.....	4,200	14
Bahia.....	Southampton.....	4,505	16
Bahia.....	Liverpool.....	4,430	19
Batavia.....	Marseilles.....	7,178	27
Batavia.....	Southampton.....	8,330	30
Bombay.....	London.....	6,658	25
Bombay.....	Liverpool.....	6,255	27
Bombay.....	Marseilles.....	4,925	16
Boston.....	Glasgow.....	2,785	10
Boston.....	Liverpool.....	2,932	9
Buenos Aires.....	Southampton.....	6,126	22
Buenos Aires.....	Liverpool.....	6,253	25
Calcutta.....	Liverpool.....	7,985	34
Callao.....	Liverpool.....	9,895	40
Cape Town.....	Southampton.....	6,010	19-24
Christiania.....	Hull.....	558	2
Colon.....	Southampton.....	5,252	19
Constantinople.....	Liverpool.....	3,015	10
Copenhagen.....	Leith, Hull.....	616	58hrs
Fiji Islands.....	Vancouver.....	5,235	18
Fiji Islands.....	Sydney.....	1,725	6
Genoa.....	Southampton.....	2,134	8
Genoa.....	Glasgow.....	2,254	10
Gibraltar.....	London.....	1,290	5
Gothenburg.....	London.....	644	3
Halifax.....	Liverpool.....	2,415	7

Standard Time

(Based on Hazell's Annual, 1903)

Generally speaking, Greenwich time, or Greenwich time plus or minus an integral

number of hours, is in use in most of the leading countries of the world.

Greenwich time is used in

Great Britain
Spain
Belgium
Holland

One hour faster than Greenwich in

Italy
Austria
Switzerland
Germany
Denmark
Norway

Two hours faster than Greenwich in

Cape Colony
The Transvaal
Orange River Colony
Natal
Turkey
Egypt

Eight hours faster than Greenwich in

West Australia
Shanghai

Nine hours faster than Greenwich in

Japan

Nine and one-half hours faster than Greenwich in

South Australia

Ten hours faster than Greenwich in

Victoria
Queensland
New South Wales

Eleven hours faster than Greenwich in

New Zealand

In the United States and the Dominion of Canada, Greenwich time is used. These countries extend over so many degrees of longitude, however, that they are necessarily divided into five belts, in which the time is slower than Greenwich time by four, five, six, seven, and eight hours, respectively. The time in these belts is known as intercolonial, eastern, central, mountain, and Pacific time. The lines dividing the belts have been determined by the railroads. People traveling west in the United States set their watches back one hour when crossing from one belt to the next. Traveling east they set them forward.

REFERENCE TABLES

The Leading Commercial Countries

(Based on the Statesman's Year Book, 1904, and Chisholm's Handbook of Commercial Geography.)

COUNTRY.	PRINCIPAL PRODUCTS.	PRINCIPAL EXPORTS.	TOTAL VALUE OF EXPORTS.
Afghanistan.....	Fruits, felt, wool.....	Horses, fruits, grain.....	\$ 62,496,000
Algeria.....	Wine, wool, potatoes.....	Wine, wool, potatoes.....	178,128,000
Argentine Republic.....	Animal products, wheat.....	Animal products, wheat.....	348,120,000
Australia.....	Wool, gold, wheat.....	Gold, wool.....	386,544,000
Austria-Hungary.....	Cereals, coal, iron.....	Sugar, animals, animal products, coal.....	787,915,000
Belgium.....	Cereals, coal, iron.....	Coal, woolens, linens.....	11,777,000
Bolivia.....	Minerals, rubber.....	Silver, tin, rubber.....	174,936,000
Brazil.....	Coffee, rubber, tobacco.....	Coffee, rubber, tobacco.....	20,737,000
Bulgaria.....	Wheat, wine, tobacco.....	Grain, animal food, food products.....	225,850,000
Canada.....	Grain, timber, metals.....	Timber, cheese, wheat.....	83,789,000
Cape of Good Hope.....	Diamonds, gold, wool.....	Diamonds, gold, wool.....	27,975,000
Ceylon.....	Rice, tea, cocoa.....	Tea, cocoanut-products, plumbago.....	66,017,000
Chile.....	Minerals, cereals, guano.....	Nitre, copper, iodine.....	148,354,000
China.....	Cereals, tea, silk.....	Silk, tea, cotton.....	3,417,000
Colombia.....	Gums, coffee, precious metals.....	Gums, coffee, gold.....	5,433,000
Costa Rica.....	Coffee, bananas.....	Coffee, bananas.....	94,445,000
Cuba.....	Sugar, tobacco.....	Sugar, tobacco, cigars.....	119,611,000
Denmark.....	Dairy products, cereals.....	Provisions, animals, cereals.....	102,007,000
Dutch East Indies.....	Coffee, tea, sugar.....	Coffee, tea, sugar.....	8,873,000
Ecuador.....	Cacao, ivory-nuts, coffee.....	Cacao, ivory-nuts, coffee.....	12,760,000
Egypt.....	Cotton, cereals, sugar.....	Cotton, cereals, provisions.....	26,228,000
France.....	Cereals, wine, sugar.....	Textiles, yarn, wine.....	270,514,000
Germany.....	Cereals, coal, iron.....	Textiles, hardware, chemicals.....	133,928,000
Greece.....	Cereals, fruits, tobacco.....	Currents, ores, olive oil.....	4,158,000
Guatemala.....	Coffee, sugar, bananas.....	Coffee, timber, hides.....	2,629,000
Haiti.....	Coffee, woods, cacao.....	Coffee, woods, cacao.....	90,955,000
Hawaii.....	Sugar, rice, coffee.....	Sugar, rice, coffee.....	34,651,000
India.....	Cereals, cotton, oil-seeds.....	Cotton, rice, oil-seeds.....	30,710,000
Italy.....	Silk, fruit, grain.....	Silk, olive oil, sulphur.....	469,040,000
Jamaica.....	Sugar, coffee, fruit.....	Fruit, sugar, rum.....	13,672,000
Japan.....	Cereals, tea, silk.....	Silks, cotton yarn, coal.....	13,803,000
Korea.....	Gold, grain, ginseng.....	Gold, rice, ginseng.....	1,003,000
Madagascar.....	Gold, cattle, rice.....	Gold, cattle, raffia.....	1,392,231,000
Mexico.....	Metals, henequen, animals.....	Metals, henequen, animals.....	1,392,231,000
Morocco.....	Grain, eggs, almonds.....	Grain, eggs, almonds.....	1,392,231,000
Natal.....	Coal, sugar, cereals.....	Coal, wool, sugar.....	1,392,231,000
Netherlands.....	Cereals, textiles, dairy products.....	Cereals, hardware, textiles.....	1,392,231,000
Newfoundland.....	Fish, iron, coal.....	Fish, iron ore, fish oil.....	1,392,231,000
Norway.....	Timber, fish, animals.....	Timber fish, paper.....	1,392,231,000
Orange River Colony.....	Diamonds, coal, sheep.....	Diamonds, garnets, sheep.....	1,392,231,000
Panama.....	Fruit, coffee, rubber.....	Fruit, coffee, rubber.....	1,392,231,000
Paraguay.....	Paraguay tea, fruit, cattle.....	Paraguay tea, tobacco, hides.....	1,392,231,000
Persia.....	Fruit, cotton, opium.....	Fruit, cotton, opium.....	1,392,231,000
Peru.....	Metals, sugar, cotton.....	Metals, sugar, cotton.....	1,392,231,000
Philippines.....	Hemp, copra, sugar, tobacco.....	Hemp, tobacco, sugar.....	1,392,231,000
Porto Rico.....	Coffee, sugar, tobacco.....	Sugar, tobacco, coffee.....	1,392,231,000
Portugal.....	Wine, cereals, fruit.....	Wine, cork, canned fish.....	1,392,231,000
Roumania.....	Grain, sheep, cattle.....	Grain, fruit, wood.....	1,392,231,000
Russia.....	Grain, petroleum, fibers.....	Grain, raw materials, animal products.....	1,392,231,000
Salvador.....	Coffee, indigo, tobacco.....	Coffee, indigo, sugar.....	1,392,231,000
San Domingo.....	Sugar, cacao, tobacco.....	Sugar, cacao, tobacco.....	1,392,231,000
Servia.....	Grain, plums, animals.....	Animal products, grain.....	1,392,231,000
Siam.....	Rice, teak, sea products.....	Rice, teak, sea products.....	1,392,231,000
Spain.....	Grain, fruits, minerals.....	Wine, minerals, fruit.....	1,392,231,000
Straits Settlements.....	Tin, gums, pepper.....	Tin, gums, spices.....	1,392,231,000
Sweden.....	Timber, iron, grain.....	Timber, animals, metals.....	1,392,231,000
Switzerland.....	Dairy products, animals, fruits.....	Silk, cottons, clocks and watches.....	1,392,231,000
The Transvaal.....	Gold, coal, sheep.....	Gold, coal, wool.....	1,392,231,000
Turkey.....	Tobacco, cereals, fruits.....	Grapes, silk, wheat.....	1,392,231,000
United Kingdom.....	Textiles, steel manufactures.....	Textiles, steel manufactures.....	1,392,231,000
United States.....	Cereals, cotton, minerals.....	Cotton, grain, railway supplies.....	1,392,231,000
Uruguay.....	Animal products, grain.....	Meat, hides, grain.....	33,603,000
Venezuela.....	Coffee, cacao, animals.....	Coffee, cacao, hides.....	14,900,000
Zanzibar.....	Spices.....	Cloves.....	5,185,000

Their Productions, Exports, and Imports

(Based on the Statesman's Year Book, 1904, and Chisholm's Handbook of Commercial Geography.)

PRINCIPAL IMPORTS.	TOTAL VALUE OF IMPORTS.	PRINCIPAL PORTS.	COUNTRY.
Cotton, indigo, sugar, tea....	\$ 66,557,000	Algeria.....	Afghanistan.
Cottons, skins, furniture.....	103,039,000	Buenos Aires.....	Algeria.
Textiles, agricultural implements.....	202,782,000	Adelaide, Melbourne, Sydney.....	Argentine Republic.
Machinery, cottons, woolens.....	321,792,000	Trieste.....	Australia.
Wool, cotton, coal, tobacco.....	694,632,000	Antwerp.....	Austria-Hungary.
Foodstuffs, timber, wool.....	5,940,000	Rio de Janeiro, Bahia Santos.....	Belgium.
Cottons, woolens, hardware.....	109,672,000	Varna.....	Bolivia.
Foodstuffs, cottons, coal.....	14,249,000	Quebec, Montreal, Halifax.....	Brazil.
Textiles, metals, machinery.....	241,215,000	Cape Town, Port Elizabeth, E. London.....	Bulgaria.
Steel manufactures, coal, woolens.....	164,261,000	Colombo.....	Canada.
Textiles, food products.....	27,367,000	Valparaiso, Iquique.....	Cape of Good Hope.
Grain, coal, cottons.....	47,674,000	Shanghai, Canton.....	Ceylon.
Textiles, minerals, oils.....	218,434,000	Barranquilla.....	Chile.
Cottons opium, rice.....	2,040,000	Puerto Limon.....	China.
Flour, salt, petroleum.....	4,237,000	Havana, Santiago de Cuba.....	Colombia.
Foodstuffs, dry goods, hardware.....	62,135,000	Copenhagen.....	Costa Rica.
Textiles, rice, food products.....	150,596,000	Batavia, Surabaya.....	Cuba.
Provisions, textiles, hardware.....	91,692,000	Guayaquil.....	Denmark.
Cottons, manure, hardware.....	7,077,000	Alexandria, Port Said.....	Dutch East Indies.
Cottons, woolens, hardware.....	82,761,000	Marselles, Le Havre, Bordeaux.....	Ecuador.
Cottons, coal, wood.....	1,139,720,000	Hamburg, Bremen, Stettin.....	Egypt.
Wool, raw silk, coal.....	1,393,386,000	Piraeus, Patras.....	France.
Provisions, raw materials, oil.....	28,101,000	San Jose, Puerto Barrios.....	Germany.
Cereals, yarns, coal.....	2,256,000	Port au Prince.....	Greece.
Cottons, provisions, beverages.....	5,500,000	Honolulu.....	Guatemala.
Cottons, sacks, hardware.....	13,030,000	Calcutta, Bombay, Rangoon.....	Haiti.
Manufactured goods, foodstuffs.....	165,455,000	Venice, Genoa, Leghorn.....	Hawaii.
Cottons, hardware, sugar.....	355,149,000	Kingston, Port Antonio.....	India.
Grain, cotton, coal.....	9,742,000	Yokohama, Nagasaki.....	Italy.
Cottons, fish, flour.....	145,405,000	Chemulpo.....	Jamaica.
Cottons, sugar, hardware.....	6,771,000	Tamatave.....	Japan.
Cottons, silks, oil.....	8,458,000	Vera Cruz, Tampico.....	Korea.
Cottons, rice, wine.....	75,902,000	Tangier.....	Madagascar.
Hardware, textiles, coal.....	10,275,000	Durban.....	Mexico.
Cottons, sugar, tea.....	63,924,000	Rotterdam, Amsterdam.....	Morocco.
Hardware, dry goods, provisions.....	868,800,000	St. Johns.....	Natal.
Cereals, iron, textiles.....	7,729,000	Christiania, Bergen, Trondhjem.....	Netherlands.
Flour, textiles, provisions.....	78,360,000	Panama, Colon.....	Newfoundland.
Provisions, metals, textiles.....	11,808,000	Bushire.....	Norway.
Dry goods, food, hardware.....	2,569,000	Callao.....	Orange River Colony.
Cottons, flour, provisions.....	2,332,000	Manila.....	Panama.
Textiles.....	23,886,000	Ponce, San Juan, Mayaguez.....	Paraguay.
Cottons, sugar, woolens.....	16,187,000	Oporto, Lisbon.....	Persia.
Breadstuffs, hardware, cottons.....	33,342,000	Galatz.....	Peru.
Rice, flour, wine.....	11,976,000	St. Petersburg, Odessa.....	Philippines.
Cottons.....	60,044,000	Acajutla, Libertad.....	Porto Rico.
Cottons, coal, codfish.....	56,669,000	Puerto Plata, Samana.....	Portugal.
Textiles, metals, hides.....	280,800,000	Bankok.....	Roumania.
Raw materials, manufactures.....	6,868,000	Barcelona, Cartagena, Malaga.....	Russia.
Cottons, breadstuffs, woolens.....	2,987,000	Singapore.....	Salvador.
Cottons, hardware, provisions.....	8,606,000	Gothenburg, Stockholm.....	San Domingo.
Cottons, metals, woolens.....	6,290,000	Constantinople.....	Servia.
Cottons, sacks, opium.....	162,168,000	London, Liverpool, Glasgow.....	Siam.
Grain, cotton, timber.....	161,682,000	New York, Boston, New Orleans.....	Spain.
Rice, cottons, opium.....	125,896,000	Montevideo.....	Straits Settlements.
Coal, metal goods, yarns.....	215,743,000	La Guaira, Puerto Cabello, Maracaibo.....	Sweden.
Foodstuffs, silk, metals.....	65,338,000	Zanzibar.....	Switzerland.
Hardware, clothing, provisions.....	107,785,000		The Transvaal.
Cottons, sugar, coffee.....	2,605,950,000		Turkey.
Breadstuffs, meat, cotton.....	1,025,719,000		United Kingdom.
Sugar, chemicals, coffee.....	23,517,000		United States.
Food, machinery, textiles.....	8,560,000		Uruguay.
Textiles, hardware, provisions.....	5,310,000		Venezuela.
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